(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 February 2002 (07.02.2002)

PCT

(10) International Publication Number
WO 02/09573 A2

(51) International Patent Classification[7]: A61B

(21) International Application Number: PCT/US01/24104

(22) International Filing Date: 31 July 2001 (31.07.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/221,735 31 July 2000 (31.07.2000) US

(71) Applicant: **THE BRIGHAM AND WOMEN'S HOSPITAL, INC.** [US/US]; 75 Francis Street, Boston, MA 02115 (US).

(72) Inventor: **MUTTER, George, L.**; 230 Middlesex Road, Chestnut Hill, MA 02467-1841 (US).

(74) Agents: **VAN AMSTERDAM, John, R.** et al.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US).

(81) Designated States *(national)*: CA, JP.

(84) Designated States *(regional)*: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 02/09573 A2

(54) Title: PROGNOSTIC CLASSIFICATION OF ENDOMETRIAL CANCER

(57) Abstract: The invention provided sets of genes that are expressed differentially in normal and malignant endometrium. These sets of genes can be used to discriminate between normal and malignant endometrial tissues. Accordingly, diagnosticd assays for classification of tumors, prediction of tumor outcome, selecting and monitoring treatment regimens and monitoring tumor progression/regression also are provided.

PROGNOSTIC CLASSIFICATION OF ENDOMETRIAL CANCER

Field of the Invention

The invention relates to nucleic acid microarray markers for cancer, particularly for endometrial cancer. The invention also relates to methods for diagnosing cancer as well as optimizing cancer treatment strategies.

Background of the Invention

Endometrioid endometrial adenocarcinomas are the most common gynecologic malignancy, the risk of which is increased by an abnormal endocrine environment or premalignant lesions with loss of tumor suppressor function. The 6000 deaths yearly make uterine cancer the seventh leading cause of death from malignancy in females. It is primarily a disease of postmenopausal women, although 25 percent of cases occur in women below age 50 and 5 percent below age 40 (Harrison's Principles of Internal Medicine 1998).

Although much progress has been made toward understanding the biological basis of cancer and in its diagnosis and treatment, it is still one of the leading causes of death in the United States. Inherent difficulties in the diagnosis and treatment of cancer include among other things, the existence of many different subgroups of cancer and the concomitant variation in appropriate treatment strategies to maximize the likelihood of positive patient outcome.

The prognosis of endometrial cancer depends upon stage, histologic grade, and extent of myometrial invasion. The staging of endometrial cancer requires surgery to establish the extent of disease and the depth of myometrial invasion. Peritoneal fluid should be sampled; the abdomen and pelvis explored; and pelvic and para-aortic lymphadenectomy performed depending upon the histology, grade, and depth of invasion in the uterine specimen on frozen section.

Initial evaluation of patients suspected of endometrial cancer includes a history and physical and pelvic examination followed by an endometrial biopsy or a fractional dilation and curettage. Outpatient procedures such as endometrial biopsy or aspiration curettage can be used but are definitive only when positive. Once a diagnosis is made, the options for treating endometrial cancer are assessed with respect to the needs of the patient. These options traditionally include surgical intervention, radiotherapy, chemotherapy, and adjuvant systemic therapies. Adjuvants may include but are not limited to chemotherapy, radiotherapy, and

endocrine therapies with progestational agents such as hydroxyprogesterone, megastrol, and deoxyprogesterone, and the antiestrogen tamoxifen.

It is difficult to predict from standard clinical and pathologic features the clinical course of endometrial cancer. However, it is very important in the treatment of endometrial cancer to select and implement an appropriate combination of therapeutic approaches. The available methods for designing strategies for treating endometrial cancer patients are complex and time consuming. The wide range of cancer subgroups and variations in disease progression limit the predictive ability of the healthcare professional. In addition, continuing development of novel treatment strategies and therapeutics will result in the addition of more variables to the already complex decision-making process involving matching the cancer patient with a treatment regimen that is appropriate and optimized for the cancer stage, extent of myometrial invasion, tumor growth rate, and other factors central to the individual patient's prognosis. Because of the critical importance of selecting appropriate treatment regimens for endometrial cancer patients, the development of guidelines for treatment selection is of key interest to those in the medical community and their patients. Thus, there presently is a need for objective, reproducible, and sensitive methods for predicting endometrial cancer patient outcome and selecting optimal treatment regimens.

Summary of the Invention

It now has been discovered that particular sets of genes are expressed differentially in normal and malignant endometrium. These sets of genes can be used to discriminate between normal and malignant endometrial tissues. Accordingly, diagnostic assays for classification of tumors, prediction of tumor outcome, selecting and monitoring treatment regimens, and monitoring tumor progression/regression can now be based on the expression of sets of genes.

According to one aspect of the invention, methods for diagnosing endometrial cancer in a subject suspected of having endometrial cancer are provided. The methods include obtaining from the subject an endometrial tissue sample and determining the expression of a set of nucleic acid molecules or expression products thereof in the endometrial tissue sample. The set of nucleic acid molecules includes at least two nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50. In preferred embodiments, the endometrial tissue sample is suspected of being cancerous.

In some embodiments the set of nucleic acid molecules includes more than 2, and up to all of the nucleic acid molecules set forth as SEQ ID NOs:1-50, and any number of nucleic acid sequences between these two numbers. For example, in certain embodiments the set includes at least 3, 4, 5, 10, 15, 20, 30, 40 or more nucleic acid molecules of the nucleic acid molecules set forth as SEQ ID NOs:1-50.

In other embodiments, the method further includes determining the expression of the set of nucleic acid molecules or expression products thereof in a non-cancerous endometrial tissue sample, and comparing the expression of the set of nucleic acid molecules or expression products thereof in the endometrial tissue sample suspected of being cancerous and the non-cancerous endometrial tissue sample.

The invention in another aspect provides solid-phase nucleic acid molecule arrays. The arrays have a cancer gene marker set that consists essentially of at least two and as many as all of the nucleic acid molecules set forth as SEQ ID NOs:1-50 fixed to a solid substrate. The set of nucleic acid markers can include any number of nucleic acid sequences between these two numbers, selected from SEQ ID NOs:1-50. For example, in certain embodiments the set includes at least 3, 4, 5, 10, 15, 20, 30, 40 or more nucleic acid molecules of the nucleic acid molecules set forth as SEQ ID NOs:1-50. In some embodiments, the solid-phase nucleic acid molecule array also includes at least one control nucleic acid molecule.

In certain embodiments, the solid substrate includes a material selected from the group consisting of glass, silica, aluminosilicates, borosilicates, metal oxides such as alumina and nickel oxide, various clays, nitrocellulose, or nylon. Preferably the substrate is glass.

In other embodiments, the nucleic acid molecules are fixed to the solid substrate by covalent bonding.

According to yet another aspect of the invention, protein microarrays are provided. The protein microarrays include antibodies or antigen-binding fragments thereof, that specifically bind at least two different polypeptides selected from the group consisting of SEQ ID NOs:51-100, fixed to a solid substrate. In some embodiments, the microarray comprises antibodies or antigen-binding fragments thereof, that bind specifically to least 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 or 50 different polypeptides selected from the group consisting of SEQ ID NOs:51-100. In certain embodiments, the microarray also includes an antibody or antigen-binding fragment thereof, that binds specifically to a cancer-associated

polypeptide other than those selected from the group consisting of SEQ ID NOs:51-100, preferably An endometrial cancer associated polypeptide. In some embodiments, the protein microarray also includes at least one control polypeptide molecule. In further embodiments, the antibodies are monoclonal or polyclonal antibodies. In other embodiments, the antibodies are chimeric, human, or humanized antibodies. In some embodiments, the antibodies are single chain antibodies. In still other embodiments, the antigen-binding fragments are $F(ab')_2$, Fab, Fd, or Fv fragments.

According to yet another aspect of the invention, protein microarrays are provided. The protein microarrays include antibodies or antigen-binding fragments thereof, that specifically bind at least two different polypeptides selected from the group consisting of SEQ ID NOs:51-100, fixed to a solid substrate. In some embodiments, the microarray comprises antibodies or antigen-binding fragments thereof, that bind specifically to least 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 or 50 different polypeptides selected from the group consisting of SEQ ID NOs:51-100. In certain embodiments, the microarray also includes an antibody or antigen-binding fragment thereof, that binds specifically to a cancer-associated polypeptide other than those selected from the group consisting of SEQ ID NOs:51-100, preferably an endometrial cancer associated polypeptide. In some embodiments, the protein microarray also includes at least one control polypeptide molecule. In further embodiments, the antibodies are monoclonal or polyclonal antibodies. In other embodiments, the antibodies are chimeric, human, or humanized antibodies. In some embodiments, the antibodies are single chain antibodies. In still other embodiments, the antigen-binding fragments are $F(ab')_2$, Fab, Fd, or Fv fragments.

In a further aspect of the invention, methods for identifying lead compounds for a pharmacological agent useful in the treatment of endometrial cancer are provided. The methods include contacting an endometrial cancer cell or tissue with a candidate pharmacological agent, and determining the expression of a set of nucleic acid molecules in the endometrial cancer cell or tissue sample under conditions which, in the absence of the candidate pharmacological agent, permit a first amount of expression of the set of nucleic acid molecules. The set of nucleic acid molecules includes at least two and as many as all of the nucleic acid molecules set forth as SEQ ID NOs:1-50. The methods also include detecting a test amount of the expression of the set of nucleic acid molecules, wherein a decrease in the test amount of expression in the presence of

the candidate pharmacological agent relative to the first amount of expression indicates that the candidate pharmacological agent is a lead compound for a pharmacological agent that is useful in the treatment of endometrial cancer.

In some embodiments of any of the foregoing methods and products, the differences in the expression of the nucleic acid molecules are determined by nucleic acid hybridization or nucleic acid amplification methods. Preferably the nucleic acid hybridization is performed using a solid-phase nucleic acid molecule array. In other embodiments, the differences in the expression of the nucleic acid molecules are determined by protein expression analysis, preferably SELDI mass spectroscopy.

These and other aspects of the invention will be described in greater detail below.

Detailed Description of the Invention

The invention described herein relates to the identification of a set of genes expressed in endometrial cancer tissue that are predictive of the clinical outcome of the cancer. Changes in cell phenotype in cancer are often the result of one or more changes in the genome expression of the cell. Some genes are expressed in tumor cells, and not in normal cells. In addition, different genes are expressed in different subgroups of endometrial cancers, which have different prognoses and require different treatment regimens to optimize patient outcome. The differential expression of endometrial cancer genes can be examined by the assessment of nucleic acid or protein expression in the endometrial cancer tissue.

The genes identified permit, *inter alia*, rapid screening of cancer samples by nucleic acid microarray hybridization or protein expression technology to determine the expression of the specific genes and thereby to predict the outcome of the cancer. Such screening is beneficial, for example, in selecting the course of treatment to provide to the cancer patient, and to monitor the efficacy of a treatment.

The invention differs from traditional endometrial cancer diagnostic and classification techniques with respect to the speed, simplicity, and reproducibility of the cancer diagnostic assay. The invention also presents targets for drug development because it identifies genes that are differentially expressed in outcome endometrial tumors, which can be utilized in the development of drugs to treat such tumors, e.g., by reducing expression of the genes or reducing activity of proteins encoded by the genes.

The invention simplifies prognosis determination by providing an identified set of genes whose expression in endometrial cancers predicts clinical outcome as defined by tumor metastasis, recurrence, or death. In the invention RNA expression phenotyping was performed using high density microarrays generated from quantitative expression data on over 5000 (estimated 5800) genes, which have been analyzed to identify 50 specific probe sets (genes). The expression gene set has multifold uses including, but not limited to, the following examples. The expression gene set may be used as a prognostic tool for endometrial cancer patients, to make possible more finely tuned diagnosis of endometrial cancer and allow healthcare professionals to tailor treatment to individual patients' needs. The invention can also assess the efficacy of endometrial cancer treatment by determining progression or regression of endometrial cancer in patients before, during, and after endometrial cancer treatment. Another utility of the expression gene set is in the biotechnology and pharmaceutical industries' research on disease pathway discovery for therapeutic targeting. The invention can identify alterations in gene expression in endometrial cancer and can also be used to uncover and test candidate pharmaceutical agents to treat endometrial cancer.

As used herein, a subject is a human, non-human primate, cow, horse, pig, sheep, goat, dog, cat, or rodent. In all embodiments human subjects are preferred. Preferably the subject is a human either suspected of having endometrial cancer, or having been diagnosed with endometrial cancer. In a preferred embodiment of the invention the cancer is endometroid endometrial adenocarcinoma. Methods for identifying subjects suspected of having endometrial cancer may include physical examination, subject's family medical history, subject's medical history, endometrial biopsy, or a number of imaging technologies such as ultrasonography, computed tomography, magnetic resonance imaging, magnetic resonance spectroscopy, or positron emission tomography. Diagnostic methods for endometrial cancer and the clinical delineation of endometrial cancer diagnoses are well known to those of skill in the medical arts.

As used herein, endometrial tissue sample is tissue obtained from an endometrial tissue biopsy using methods well known to those of ordinary skill in the related medical arts. The phrase "suspected of being cancerous" as used herein means an endometrial cancer tissue sample believed by one of ordinary skill in the medical arts to contain cancerous cells. Methods for obtaining the sample from the biopsy include gross apportioning of a mass, microdissection, laser-based microdissection, cytologic sampling of the endometrium using a brush, aspiration curettage, fractional dilation and curettage, or other art-known cell-separation methods.

Because of the variability of the cell types in diseased-tissue biopsy material, and the variability in sensitivity of the diagnostic methods used, the sample size required for analysis may range from 1, 10, 50, 100, 200, 300, 500, 1000, 5000, 10,000, to 50,000 or more cells. The appropriate sample size may be determined based on the cellular composition and condition of the biopsy and the standard preparative steps for this determination and subsequent isolation of the nucleic acid for use in the invention are well known to one of ordinary skill in the art. An example of this, although not intended to be limiting, is that in some instances a sample from the biopsy may be sufficient for assessment of RNA expression without amplification, but in other instances the lack of suitable cells in a small biopsy region may require use of RNA conversion and/or amplification methods or other methods to enhance resolution of the nucleic acid molecules. Such methods, which allow use of limited biopsy materials, are well known to those of ordinary skill in the art and include, but are not limited to: direct RNA amplification, reverse transcription of RNA to cDNA, amplification of cDNA, or the generation of radio-labeled nucleic acids.

As used herein, the phrase "determining the expression of a set of nucleic acid molecules in the endometrial tissue" means identifying RNA transcripts in the tissue sample by analysis of nucleic acid or protein expression in the tissue sample. As used herein, "set" refers to a group of nucleic acid molecules that include 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or 50 different nucleic acid sequences from the group of nucleic acid sequences numbered 1 through 50 in Table 1 (SEQ ID NOs: 1-50).

The expression of the set of nucleic acid molecules in the sample from the endometrial cancer patient can be compared to the expression of the set of nucleic acid molecules in a sample of endometrial tissue that is non-cancerous. As used herein, non-cancerous endometrial tissue means tissue determined by one of ordinary skill in the medical art to have no evidence of endometrial cancer based on standard diagnostic methods including, but not limited to, histologic staining and microscopic analysis.

Nucleic acid markers for cancer are nucleic acid molecules that by their presence or absence indicate the presence of absence of endometrial cancer. In tissue, certain nucleic acid molecules are expressed at different levels depending on whether tissue is non-cancerous or cancerous.

Hybridization methods for nucleic acids are well known to those of ordinary skill in the art (see, e.g. *Molecular Cloning: A Laboratory Manual*, J. Sambrook, et al., eds., Second Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York, 1989, or *Current Protocols in Molecular Biology*, F.M. Ausubel, et al., eds., John Wiley & Sons, Inc., New York). The nucleic acid molecules from an endometrial cancer tissue sample hybridize under stringent conditions to nucleic acid markers expressed in endometrial cancer. In one embodiment the markers are sets of two or more of the nucleic acid molecules as set forth in SEQ ID NOs: 1 through 50.

The endometrial cancer nucleic acid markers disclosed herein are known genes and fragments thereof. It may be desirable to identify variants of those genes, such as allelic variants or single nucleotide polymorphisms (SNPs) in tissues. Accordingly, methods for identifying endometrial cancer nucleic acid markers, including variants of the disclosed full-length cDNAs, genomic DNAs, and SNPs are also included in the invention. The methods include contacting a nucleic acid sample (such as a cDNA library, genomic library, genomic DNA isolate, etc.) with a nucleic acid probe or primer derived from one of SEQ ID NOs:1-50. The nucleic acid sample and the probe or primer hybridize to complementary nucleotide sequences of nucleic acids in the sample, if any are present, allowing detection of nucleic acids related to SEQ ID NOs: 1-50. Preferably the probe or primer is detectably labeled. The specific conditions, reagents, and the like can be selected by one of ordinary skill in the art to selectively identify nucleic acids related to sets of two or more of SEQ ID NOs:1 through 50. The isolated nucleic acid molecule can be sequenced according to standard procedures.

In addition to native nucleic acid markers (SEQ ID NOs:1-50), the invention also includes degenerate nucleic acids that include alternative codons to those present in the native materials. For example, serine residues are encoded by the codons TCA, AGT, TCC, TCG, TCT, and AGC. Each of the six codons is equivalent for the purposes of encoding a serine residue. Similarly, nucleotide sequence triplets that encode other amino acid residues include, but are not limited to: CCA, CCC, CCG, and CCT (proline codons); CGA, CGC, CGG, CGT, AGA, and AGG (arginine codons); ACA, ACC, ACG, and ACT (threonine codons); AAC and AAT (asparagine codons); and ATA, ATC, and ATT (isoleucine codons). Other amino acid residues may be encoded similarly by multiple nucleotide sequences. Thus, the invention embraces degenerate nucleic acids that differ from the biologically isolated nucleic acids in codon sequence due to the degeneracy of the genetic code.

The invention also provides modified nucleic acid molecules, which include additions, substitutions, and deletions of one or more nucleotides such as the allelic variants and SNPs described above. In preferred embodiments, these modified nucleic acid molecules and/or the polypeptides they encode retain at least one activity or function of the unmodified nucleic acid molecule and/or the polypeptides, such as hybridization, antibody binding, etc. In certain embodiments, the modified nucleic acid molecules encode modified polypeptides, preferably polypeptides having conservative amino acid substitutions. As used herein, a "conservative amino acid substitution" refers to an amino acid substitution which does not alter the relative charge or size characteristics of the protein in which the amino acid substitution is made. Conservative substitutions of amino acids include substitutions made amongst amino acids within the following groups: (a) M, I, L, V; (b) F, Y, W; (c) K, R, H; (d) A, G; (e) S, T; (f) Q, N; and (g) E, D. The modified nucleic acid molecules are structurally related to the unmodified nucleic acid molecules and in preferred embodiments are sufficiently structurally related to the unmodified nucleic acid molecules so that the modified and unmodified nucleic acid molecules hybridize under stringent conditions known to one of skill in the art.

For example, modified nucleic acid molecules that encode polypeptides having single amino acid changes can be prepared for use in the methods and products disclosed herein. Each of these nucleic acid molecules can have one, two, or three nucleotide substitutions exclusive of nucleotide changes corresponding to the degeneracy of the genetic code as described herein. Likewise, modified nucleic acid molecules that encode polypeptides having two amino acid changes can be prepared, which have, e.g., 2-6 nucleotide changes. Numerous modified nucleic acid molecules like these will be readily envisioned by one of skill in the art, including for example, substitutions of nucleotides in codons encoding amino acids 2 and 3, 2 and 4, 2 and 5, 2 and 6, and so on. In the foregoing example, each combination of two amino acids is included in the set of modified nucleic acid molecules, as well as all nucleotide substitutions that code for the amino acid substitutions. Additional nucleic acid molecules that encode polypeptides having additional substitutions (i.e., 3 or more), additions or deletions [e.g., by introduction of a stop codon or a splice site(s)] also can be prepared and are embraced by the invention as readily envisioned by one of ordinary skill in the art. Any of the foregoing nucleic acids can be tested by routine experimentation for retention of structural relation to or activity similar to the nucleic acids disclosed herein.

In the invention, standard hybridization techniques of microarray technology are utilized to assess patterns of nucleic acid expression and identify nucleic acid marker expression. Microarray technology, which is also known by other names including: DNA chip technology, gene chip technology, and solid-phase nucleic acid array technology, is well known to those of ordinary skill in the art and is based on, but not limited to, obtaining an array of identified nucleic acid probes on a fixed substrate, labeling target molecules with reporter molecules (e.g., radioactive, chemiluminescent, or fluorescent tags such as fluorescein, Cye3-dUTP, or Cye5-dUTP), hybridizing target nucleic acids to the probes, and evaluating target-probe hybridization. A probe with a nucleic acid sequence that perfectly matches the target sequence will, in general, result in detection of a stronger reporter-molecule signal than will probes with less perfect matches. Many components and techniques utilized in nucleic acid microarray technology are presented in *The Chipping Forecast*, Nature Genetics, Vol.21, Jan 1999, the entire contents of which is incorporated by reference herein.

According to the present invention, microarray substrates may include but are not limited to glass, silica, aluminosilicates, borosilicates, metal oxides such as alumina and nickel oxide, various clays, nitrocellulose, or nylon. In all embodiments a glass substrate is preferred. According to the invention, probes are selected from the group of nucleic acids including, but not limited to: DNA, genomic DNA, cDNA, and oligonucleotides; and may be natural or synthetic. Oligonucleotide probes preferably are 20 to 25-mer oligonucleotides and DNA/cDNA probes preferably are 500 to 5000 bases in length, although other lengths may be used. Appropriate probe length may be determined by one of ordinary skill in the art by following art-known procedures. In one embodiment, preferred probes are sets of two or more of the nucleic acid molecules set forth as SEQ ID NO: 1 through 50 (see also Table 1). Probes may be purified to remove contaminants using standard methods known to those of ordinary skill in the art such as gel filtration or precipitation.

In one embodiment, the microarray substrate may be coated with a compound to enhance synthesis of the probe on the substrate. Such compounds include, but are not limited to, oligoethylene glycols. In another embodiment, coupling agents or groups on the substrate can be used to covalently link the first nucleotide or olignucleotide to the substrate. These agents or groups may include, but are not limited to: amino, hydroxy, bromo, and carboxy groups. These reactive groups are preferably attached to the substrate through a hydrocarbyl radical such as an alkylene or phenylene divalent radical, one valence position occupied by the chain bonding and

the remaining attached to the reactive groups. These hydrocarbyl groups may contain up to about ten carbon atoms, preferably up to about six carbon atoms. Alkylene radicals are usually preferred containing two to four carbon atoms in the principal chain. These and additional details of the process are disclosed, for example, in U.S. Patent 4,458,066, which is incorporated by reference in its entirety.

In one embodiment, probes are synthesized directly on the substrate in a predetermined grid pattern using methods such as light-directed chemical synthesis, photochemical deprotection, or delivery of nucleotide precursors to the substrate and subsequent probe production.

In another embodiment, the substrate may be coated with a compound to enhance binding of the probe to the substrate. Such compounds include, but are not limited to: polylysine, amino silanes, amino-reactive silanes (Chipping Forecast, 1999) or chromium (Gwynne and Page, 2000). In this embodiment, presynthesized probes are applied to the substrate in a precise, predetermined volume and grid pattern, utilizing a computer-controlled robot to apply probe to the substrate in a contact-printing manner or in a non-contact manner such as ink jet or piezo-electric delivery. Probes may be covalently linked to the substrate with methods that include, but are not limited to, UV-irradiation. In another embodiment probes are linked to the substrate with heat.

Targets are nucleic acids selected from the group, including but not limited to: DNA, genomic DNA, cDNA, RNA, mRNA and may be natural or synthetic. In all embodiments, nucleic acid molecules from human endometrial tissue are preferred. The tissue may be obtained from a subject or may be grown in culture (e.g. from a endometrial cancer cell line).

In embodiments of the invention one or more control nucleic acid molecules are attached to the substrate. Preferably, control nucleic acid molecules allow determination of factors including but not limited to: nucleic acid quality and binding characteristics; reagent quality and effectiveness; hybridization success; and analysis thresholds and success. Control nucleic acids may include but are not limited to expression products of genes such as housekeeping genes or fragments thereof.

To select a set of tumor markers, the expression data generated by, for example, microarray analysis of gene expression, preferably is analyzed to determine which genes in different groups of cancer tissues are significantly differentially expressed. In the methods disclosed herein, the significance of gene expression was determined using Permax computer

software, although any standard statistical package that can discriminate significant differences in expression may be used. Permax performs permutation 2-sample t-tests on large arrays of data. For high dimensional vectors of observations, the Permax software computes t-statistics for each attribute, and assesses significance using the permutation distribution of the maximum and minimum overall attributes.

In one embodiment of the invention, expression of nucleic acid markers is used to select clinical treatment paradigms for endometrial cancer. Treatment options, as described herein, may include but are not limited to: radiotherapy, chemotherapy, adjuvant therapy, or any combination of the aforementioned methods. Aspects of treatment that may vary include, but are not limited to: dosages, timing of administration, or duration or therapy; and may or may not be combined with other treatments, which may also vary in dosage, timing, or duration. Another treatment for endometrial cancer is surgery, which can be utilized either alone or in combination with any of the aforementioned treatment methods. One of ordinary skill in the medical arts may determine an appropriate treatment paradigm based on evaluation of differential expression of sets of two or more of the nucleic acid targets ste forth as SEQ ID NOs:1-50. Cancers that express markers that are indicative of a more aggressive cancer or poor prognosis may be treated with more aggressive therapies.

Progression or regression of endometrial cancer is determined by comparison of two or more different endometrial cancer tissue samples taken at two or more different times from a subject. For example, progression or regression may be evaluated by assessments of expression of sets of two or more of the nucleic acid targets, including but not limited to SEQ ID NOs:1-50, in an endometrial cancer tissue sample from a subject before, during, and following treatment for endometrial cancer.

In another embodiment, novel pharmacological agents useful in the treatment of endometrial cancer can be identified by assessing variations in the expression of sets of two or more endometrial cancer nucleic acid markers, from among SEQ ID NOs:1-50, prior to and after contacting endometrial cancer cells or tissues with candidate pharmacological agents for the treatment of endometrial cancer. The cells may be grown in culture (e.g. from an endometrial cancer cell line), or may be obtained from a subject, (e.g. in a clinical trial of candidate pharmaceutical agents to treat endometrial cancer). Alterations in expression of two or more sets of endometrial cancer nucleic acid markers, from among SEQ ID NOs:1-50, in endometrial cancer cells or tissues tested before and after contact with a candidate pharmacological agent to

treat endometrial cancer, indicate progression, regression, or stasis of the endometrial cancer thereby indicating efficacy of candidate agents and concomitant identification of lead compounds for therapeutic use in endometrial cancer.

The invention further provides efficient methods of identifying pharmacological agents or lead compounds for agents active at the level of endometrial cancer cellular function. Generally, the screening methods involve assaying for compounds that beneficially alter endometrial cancer nucleic acid molecule expression. Such methods are adaptable to automated, high-throughput screening of compounds.

The assay mixture comprises a candidate pharmacological agent. Typically, a plurality of assay mixtures are run in parallel with different agent concentrations to obtain a different response to the various concentrations. Typically, one of these concentrations serves as a negative control, i.e., at zero concentration of agent or at a concentration of agent below the limits of assay detection. Candidate agents encompass numerous chemical classes, although typically they are organic compounds. Preferably, the candidate pharmacological agents are small organic compounds, i.e., those having a molecular weight of more than 50 yet less than about 2500, preferably less than about 1000 and, more preferably, less than about 500. Candidate agents comprise functional chemical groups necessary for structural interactions with polypeptides and/or nucleic acids, and typically include at least an amine, carbonyl, hydroxyl, or carboxyl group, preferably at least two of the functional chemical groups and more preferably at least three of the functional chemical groups. The candidate agents can comprise cyclic carbon or heterocyclic structure and/or aromatic or polyaromatic structures substituted with one or more of the above-identified functional groups. Candidate agents also can be biomolecules such as peptides, saccharides, fatty acids, sterols, isoprenoids, purines, pyrimidines, derivatives or structural analogs of the above, or combinations thereof and the like. Where the agent is a nucleic acid, the agent typically is a DNA or RNA molecule, although modified nucleic acids as defined herein are also contemplated.

Candidate agents are obtained from a wide variety of sources including libraries of synthetic or natural compounds. For example, numerous means are available for random and directed synthesis of a wide variety of organic compounds and biomolecules, including expression of randomized oligonucleotides, synthetic organic combinatorial libraries, phage display libraries of random peptides, and the like. Alternatively, libraries of natural compounds in the form of bacterial, fungal, plant, and animal extracts are available or readily produced.

Additionally, natural and synthetically produced libraries and compounds can be readily be modified through conventional chemical, physical, and biochemical means. Further, known pharmacological agents may be subjected to directed or random chemical modifications such as acylation, alkylation, esterification, amidification, etc. to produce structural analogs of the agents.

A variety of other reagents also can be included in the mixture. These include reagents such as salts, buffers, neutral proteins (e.g., albumin), detergents, etc. which may be used to facilitate optimal protein-protein and/or protein-nucleic acid binding. Such a reagent may also reduce non-specific or background interactions of the reaction components. Other reagents that improve the efficiency of the assay such as protease, inhibitors, nuclease inhibitors, antimicrobial agents, and the like may also be used.

The mixture of the foregoing assay materials is incubated under conditions whereby, the anti-endometrial cancer candidate agent specifically binds the cellular binding target, a portion thereof or analog thereof. The order of addition of components, incubation temperature, time of incubation, and other paameters of the assay may be readily determined. Such experimentation merely involves optimization of the assay parameters, not the fundamental composition of the assay. Incubation temperatures typically are between 4°C and 40°C. Incubation times preferably are minimized to facilitate rapid, high throughput screening, and typically are between 0.1 and 10 hours.

After incubation, the presence or absence of specific binding between the anti-endometrial cancer candidate agent and one or more binding targets is detected by any convenient method available to the user. For cell-free binding type assays, a separation step is often used to separate bound from unbound components. The separation step may be accomplished in a variety of ways. Conveniently, at least one of the components is immobilized on a solid substrate, from which the unbound components may be easily separated. The solid substrate can be made of a wide variety of materials and in a wide variety of shapes, e.g., microtiter plate, microbead, dipstick, resin particle, etc. The substrate preferably is chosen to maximize signal-to-noise ratios, primarily to minimize background binding, as well as for ease of separation and cost.

Separation may be effected for example, by removing a bead or dipstick from a reservoir, emptying or diluting a reservoir such as a microtiter plate well, rinsing a bead, particle, chromotograpic column or filter with a wash solution or solvent. The separation step preferably

includes multiple rinses or washes. For example, when the solid substrate is a microtiter plate, the wells may be washed several times with a washing solution, which typically includes those components of the incubation mixture that do not participate in specific bindings such as salts, buffer, detergent, non-specific protein, etc. Where the solid substrate is a magnetic bead, the beads may be washed one or more times with a washing solution and isolated using a magnet.

Detection may be effected in any convenient way for cell-based assays such as two- or three-hybrid screens. The transcript resulting from a reporter gene transcription assay of the anti-cancer agent binding to a target molecule typically encodes a directly or indirectly detectable product, e.g., β-galactosidase activity, luciferase activity, and the like. For cell-free binding assays, one of the components usually comprises, or is coupled to, a detectable label. A wide variety of labels can be used, such as those that provide direct detection (e.g., radioactivity, luminescence, optical, or electron density, etc) or indirect detection (e.g., epitope tag such as the FLAG epitope, enzyme tag such as horseseradish peroxidase, etc.). The label may be bound to an anti-cancer agent binding partner, or incorporated into the structure of the binding partner.

A variety of methods may be used to detect the label, depending on the nature of the label and other assay components. For example, the label may be detected while bound to the solid substrate or subsequent to separation from the solid substrate. Labels may be directly detected through optical or electron density, radioactive emissions, nonradiative energy transfers, etc. or indirectly detected with antibody conjugates, strepavidin-biotin conjugates, etc. Methods for detecting the labels are well known in the art.

The invention provides endometrial cancer gene-specific binding agents, methods of identifying and making such agents, and their use in diagnosis, therapy and pharmaceutical development. For example, endometrial cancer gene-specific pharmacological agents are useful in a variety of diagnostic and therapeutic applications as described herein. In general, the specificity of an endometrial cancer gene binding to a binding agent is shown by binding equilibrium constants. Targets that are capable of selectively binding an endometrial cancer gene preferably have binding equilibrium constants of at least about 10^7 M^{-1}, more preferably at least about 10^8 M^{-1}, and most preferably at least about 10^9 M^{-1}. The wide variety of cell-based and cell-free assays may be used to demonstrate endometrial cancer gene-specific binding. Cell-based assays include one, two and three hybrid screens, assays in which endometrial cancer gene-mediated transcription is inhibited or increased, etc. Cell-free assays include endometrial cancer gene-protein binding assays, immunoassays, etc. Other assays useful for screening

agents which bind endometrial cancer polypeptides include fluorescence resonance energy transfer (FRET), and electrophoretic mobility shift analysis (EMSA).

In another aspect of the invention, pre- and post-treatment alterations in expression of two or more sets of endometrial cancer nucleic acid markers including, but not limited to, SEQ ID NOs:1-50 in endometrial cancer cells or tissues may be used to assess treatment parameters including, but not limited to: dosage, method of administration, timing of administration, and combination with other treatments as described herein.

Candidate pharmacological agents may include antisense oligonucleotides that selectively bind to an endometrial cancer nucleic acid marker molecule, as identified herein, to reduce the expression of the marker molecules in endometrial cancer cells and tissues. One of ordinary skill in the art can test of the effects of a reduction of expression of endometrial cancer nucleic acid marker sequences *in vivo* or *in vitro*, to determine the efficacy of one or more antisense oligonucleotides.

As used herein, the term "antisense oligonucleotide" or "antisense" describes an oligonucleotide that is an oligoribonucleotide, oligodeoxyribonucleotide, modified oligoribonucleotide, or modified oligodeoxyribonucleotide, which hybridizes under physiological conditions to DNA comprising a particular gene or to an mRNA transcript of that gene and, thereby, inhibits the transcription of that gene and/or the translation of that mRNA. The antisense molecules are designed so as to interfere with transcription or translation of a target gene upon hybridization with the target gene or transcript. Those skilled in the art will recognize that the exact length of the antisense oligonucleotide and its degree of complementarity with its target will depend upon the specific target selected, including the sequence of the target and the particular bases which comprise that sequence. It is preferred that the antisense oligonucleotide be constructed and arranged so as to bind selectively with the target under physiological conditions, i.e., to hybridize substantially more to the target sequence than to any other sequence in the target cell under physiological conditions.

Based upon the sequences of endometrial cancer expressed nucleic acids, or upon allelic or homologous genomic and/or cDNA sequences, one of skill in the art can easily choose and synthesize any of a number of appropriate antisense molecules for use in accordance with the present invention. In order to be sufficiently selective and potent for inhibition, such antisense oligonucleotides should comprise at least 10 and, more preferably, at least 15 consecutive bases that are complementary to the target, although in certain cases modified oligonucleotides as

short as 7 bases in length have been used successfully as antisense oligonucleotides (Wagner et al., 1996). Most preferably, the antisense oligonucleotides comprise a complementary sequence of 20-30 bases. Although oligonucleotides may be chosen that are antisense to any region of the gene or mRNA transcripts, in preferred embodiments the antisense oligonucleotides correspond to N-terminal or 5' upstream sites such as translation initiation, transcription initiation, or promoter sites. In addition, 3'-untranslated regions may be targeted. Targeting to mRNA splicing sites has also been used in the art but may be less preferred if alternative mRNA splicing occurs. In addition, the antisense is targeted, preferably, to sites in which mRNA secondary structure is not expected (see, e.g., Sainio et al., 1994) and at which proteins are not expected to bind. Finally, although the listed sequences are cDNA sequences, one of ordinary skill in the art may easily derive the genomic DNA corresponding to the cDNA of an endometrial cancer expressed polypeptide. Thus, the present invention also provides for antisense oligonucleotides that are complementary to the genomic DNA corresponding to endometrial cancer expressed nucleic acids. Similarly, the use of antisense to allelic or homologous cDNAs and genomic DNAs are enabled without undue experimentation.

In one set of embodiments, the antisense oligonucleotides of the invention may be composed of "natural" deoxyribonucleotides, ribonucleotides, or any combination thereof. That is, the 5' end of one native nucleotide and the 3' end of another native nucleotide may be covalently linked, as in natural systems, via a phosphodiester internucleoside linkage. These oligonucleotides may be prepared by art-recognized methods, which may be carried out manually or by an automated synthesizer. They also may be produced recombinantly by vectors.

In preferred embodiments, however, the antisense oligonucleotides of the invention also may include "modified" oligonucleotides. That is, the oligonucleotides may be modified in a number of ways that do not prevent them from hybridizing to their target but which enhance their stability or targeting or which otherwise enhance their therapeutic effectiveness. The term "modified oligonucleotide" as used herein describes an oligonucleotide in which (1) at least two of its nucleotides are covalently linked via a synthetic internucleoside linkage (i.e., a linkage other than a phosphodiester linkage between the 5' end of one nucleotide and the 3' end of another nucleotide) and/or (2) a chemical group not normally associated with nucleic acids has been covalently attached to the oligonucleotide. Preferred synthetic internucleoside linkages are phosphorothioates, alkylphosphonates, phosphorodithioates, phosphate esters,

alkylphosphonothioates, phosphoramidates, carbamates, carbonates, phosphate triesters, acetamidates, carboxymethyl esters, and peptides.

The term "modified oligonucleotide" also encompasses oligonucleotides with a covalently modified base and/or sugar. For example, modified oligonucleotides include oligonucleotides having backbone sugars that are covalently attached to low molecular weight organic groups other than a hydroxyl group at the 3' position and other than a phosphate group at the 5' position. Thus modified oligonucleotides may include a 2'-O-alkylated ribose group. In addition, modified oligonucleotides may include sugars such as arabinose instead of ribose. The present invention, thus, contemplates pharmaceutical preparations containing modified antisense molecules that are complementary to and hybridizable with, under physiological conditions, endometrial cancer expressed nucleic acids, together with pharmaceutically acceptable carriers.

Antisense oligonucleotides may be administered as part of a pharmaceutical composition. Such a pharmaceutical composition may include the antisense oligonucleotides in combination with any standard physiologically and/or pharmaceutically acceptable carriers which are known in the art. The compositions should be sterile and contain a therapeutically effective amount of the antisense oligonucleotides in a unit of weight or volume suitable for administration to a patient. The term "pharmaceutically acceptable" means a non-toxic material that does not interfere with the effectiveness of the biological activity of the active ingredients. The term "physiologically acceptable" refers to a non-toxic material that is compatible with a biological system such as a cell, cell culture, tissue, or organism. The characteristics of the carrier will depend on the route of administration. Physiologically and pharmaceutically acceptable carriers include diluents, fillers, salts, buffers, stabilizers, solubilizers, and other materials, which are well known in the art.

Expression of endometrial cancer nucleic acid molecules can also be determined using protein measurement methods to determine expression of SEQ ID NOs:1-50, e.g., by determining the expression of polypeptides encoded by SEQ ID NOs:1-50 (SEQ ID NOs: 51-100). Preferred methods of specifically and quantitatively measuring proteins include, but are not limited to: mass spectroscopy-based methods such as surface enhanced laser desorption ionization (SELDI; e.g., Ciphergen ProteinChip System), non-mass spectroscopy-based methods, and immunohistochemistry-based methods such as 2-dimensional gel electrophoresis.

SELDI methodology may, through procedures known to those of ordinary skill in the art, be used to vaporize microscopic amounts of tumor protein and to create a "fingerprint" of

individual proteins, thereby allowing simultaneous measurement of the abundance of many proteins in a single sample. Preferably SELDI-based assays may be utilized to classify endometrial cancer tumors. Such assays preferably include, but are not limited to the following examples. Gene products discovered by RNA microarrays may be selectively measured by specific (antibody mediated) capture to the SELDI protein disc (e.g., selective SELDI). Gene products discovered by protein screening (e.g., with 2-D gels), may be resolved by "total protein SELDI" optimized to visualize those particular markers of interest from among SEQ ID NOs:1-50. Predictive models of tumor classification from SELDI measurement of multiple markers from among SEQ ID NOs:1-50 may be utilized for the SELDI strategies. In an additional embodiment a set of endometrioid endometrial adenocarcinoma tissues may be preferably utilized to determine the risk classification of endometrial cancer based on SELDI results.

The invention also involves agents such as polypeptides that bind to endometrial cancer-associated polypeptides, i.e., SEQ ID NOs:51-100. Such binding agents can be used, for example, in screening assays to detect the presence or absence of endometrial cancer-associated polypeptides and complexes of endometrial cancer-associated polypeptides and their binding partners and in purification protocols to isolate endometrial cancer-associated polypeptides and complexes of endometrial cancer-associated polypeptides and their binding partners. Such agents also may be used to inhibit the native activity of the endometrial cancer-associated polypeptides, for example, by binding to such polypeptides.

The invention, therefore, embraces peptide binding agents which, for example, can be antibodies or fragments of antibodies having the ability to selectively bind to endometrial cancer-associated polypeptides. Antibodies include polyclonal and monoclonal antibodies, prepared according to conventional methodology.

Significantly, as is well-known in the art, only a small portion of an antibody molecule, the paratope, is involved in the binding of the antibody to its epitope (see, in general, Clark, W.R. (1986) The Experimental Foundations of Modern Immunology Wiley & Sons, Inc., New York; Roitt, I. (1991) Essential Immunology, 7th Ed., Blackwell Scientific Publications, Oxford). The pFc' and Fc regions, for example, are effectors of the complement cascade but are not involved in antigen binding. An antibody from which the pFc' region has been enzymatically cleaved, or which has been produced without the pFc' region, designated an $F(ab')_2$ fragment, retains both of the antigen binding sites of an intact antibody. Similarly, an antibody from which the Fc region has been enzymatically cleaved, or which has been produced

without the Fc region, designated an Fab fragment, retains one of the antigen binding sites of an intact antibody molecule. Proceeding further, Fab fragments consist of a covalently bound antibody light chain and a portion of the antibody heavy chain denoted Fd. The Fd fragments are the major determinant of antibody specificity (a single Fd fragment may be associated with up to ten different light chains without altering antibody specificity) and Fd fragments retain epitope-binding ability in isolation.

Within the antigen-binding portion of an antibody, as is well-known in the art, there are complementarity determining regions (CDRs), which directly interact with the epitope of the antigen, and framework regions (FRs), which maintain the tertiary structure of the paratope (see, in general, Clark, 1986; Roitt, 1991). In both the heavy chain Fd fragment and the light chain of IgG immunoglobulins, there are four framework regions (FR1 through FR4) separated respectively by three complementarity determining regions (CDR1 through CDR3). The CDRs, and in particular the CDR3 regions, and more particularly the heavy chain CDR3, are largely responsible for antibody specificity.

It is now well-established in the art that the non-CDR regions of a mammalian antibody may be replaced with similar regions of conspecific or heterospecific antibodies while retaining the epitopic specificity of the original antibody. This is most clearly manifested in the development and use of "humanized" antibodies in which non-human CDRs are covalently joined to human FR and/or Fc/pFc' regions to produce a functional antibody. See, e.g., U.S. patents 4,816,567, 5,225,539, 5,585,089, 5,693,762 and 5,859,205.

Fully human monoclonal antibodies also can be prepared by immunizing mice transgenic for large portions of human immunoglobulin heavy and light chain loci. Following immunization of these mice (e.g., XenoMouse (Abgenix), HuMAb mice (Medarex/GenPharm)), monoclonal antibodies can be prepared according to standard hybridoma technology. These monoclonal antibodies will have human immunoglobulin amino acid sequences and therefore will not provoke human anti-mouse antibody (HAMA) responses when administered to humans.

Thus, as will be apparent to one of ordinary skill in the art, the present invention also provides for $F(ab')_2$, Fab, Fv and Fd fragments; chimeric antibodies in which the Fc and/or FR and/or CDR1 and/or CDR2 and/or light chain CDR3 regions have been replaced by homologous human or non-human sequences; chimeric $F(ab')_2$ fragment antibodies in which the FR and/or CDR1 and/or CDR2 and/or light chain CDR3 regions have been replaced by homologous human or non-human sequences; chimeric Fab fragment antibodies in which the FR and/or CDR1

and/or CDR2 and/or light chain CDR3 regions have been replaced by homologous human or non-human sequences; and chimeric Fd fragment antibodies in which the FR and/or CDR1 and/or CDR2 regions have been replaced by homologous human or non-human sequences. The present invention also includes so-called single chain antibodies.

Thus, the invention involves polypeptides of numerous size and type that bind specifically to polypeptides selected from SEQ ID NOs:51-100, and complexes of both endometrial cancer-associated polypeptides and their binding partners. These polypeptides may be derived also from sources other than antibody technology. For example, such polypeptide binding agents can be provided by degenerate peptide libraries which can be readily prepared in solution, in immobilized form or as phage display libraries. Combinatorial libraries also can be synthesized of peptides containing one or more amino acids. Libraries further can be synthesized of peptoids and non-peptide synthetic moieties.

Phage display can be particularly effective in identifying binding peptides useful according to the invention. Briefly, one prepares a phage library (using e.g. m13, fd, or lambda phage), displaying inserts from 4 to about 80 amino acid residues using conventional procedures. The inserts may represent, for example, a completely degenerate or biased array. One then can select phage-bearing inserts which bind to the endometrial cancer-associated polypeptide. This process can be repeated through several cycles of reselection of phage that bind to the endometrial cancer-associated polypeptide. Repeated rounds lead to enrichment of phage bearing particular sequences. DNA sequence analysis can be conducted to identify the sequences of the expressed polypeptides. The minimal linear portion of the sequence that binds to the endometrial cancer-associated polypeptide can be determined. One can repeat the procedure using a biased library containing inserts containing part or all of the minimal linear portion plus one or more additional degenerate residues upstream or downstream thereof. Yeast two-hybrid screening methods also may be used to identify polypeptides that bind to the endometrial cancer-associated polypeptides.

Thus, the endometrial cancer-associated polypeptides of the invention, including fragments thereof, can be used to screen peptide libraries, including phage display libraries, to identify and select peptide binding partners of the endometrial cancer-associated polypeptides of the invention. Such molecules can be used, as described, for screening assays, for purification protocols, for interfering directly with the functioning of endometrial cancer-associated polypeptides and for other purposes that will be apparent to those of ordinary skill in the art. For

example, isolated endometrial cancer-associated polypeptides can be attached to a substrate (e.g., chromatographic media, such as polystyrene beads, a filter, or an array substrate), and then a solution suspected of containing the binding partner may be applied to the substrate. If a binding partner that can interact with endometrial cancer-associated polypeptides is present in the solution, then it will bind to the substrate-endometrial cancer-associated polypeptide. The binding partner then may be isolated.

As detailed herein, the foregoing antibodies and other binding molecules may be used for example, to identify tissues expressing protein or to purify protein. Antibodies also may be coupled to specific diagnostic labeling agents for imaging of cells and tissues that express endometrial cancer-associated polypeptides or to therapeutically useful agents according to standard coupling procedures. Diagnostic agents include, but are not limited to, barium sulfate, iocetamic acid, iopanoic acid, ipodate calcium, diatrizoate sodium, diatrizoate meglumine, metrizamide, tyropanoate sodium and radiodiagnostics including positron emitters such as fluorine-18 and carbon-11, gamma emitters such as iodine-123, technitium-99m, iodine-131 and indium-111, nuclides for nuclear magnetic resonance such as fluorine and gadolinium.

The invention further includes protein microarrays for analyzing expression of endometrial cancer-associated peptides selected from SEQ ID NOs:51-100. In this aspect of the invention, standard techniques of microarray technology are utilized to assess expression of the endometrial cancer-associated polypeptides and/or identify biological constituents that bind such polypeptides. The constituents of biological samples include antibodies, lymphocytes (particularly T lymphocytes), and the like. Protein microarray technology, which is also known by other names including: protein chip technology and solid-phase protein array technology, is well known to those of ordinary skill in the art and is based on, but not limited to, obtaining an array of identified peptides or proteins on a fixed substrate, binding target molecules or biological constituents to the peptides, and evaluating such binding. See, e.g., G. MacBeath and S.L. Schreiber, "Printing Proteins as Microarrays for High-Throughput Function Determination," *Science* 289(5485):1760-1763, 2000.

Preferably antibodies or antigen binding fragments thereof that specifically bind polypeptides selected from the group consisting of SEQ ID NOs:51-100 are attached to the microarray substrate in accordance with standard attachment methods known in the art. These arrays can be used to quantify the expression of the polypeptides identified herein.

In some embodiments of the invention, one or more control peptide or protein molecules are attached to the substrate. Preferably, control peptide or protein molecules allow determination of factors such as peptide or protein quality and binding characteristics, reagent quality and effectiveness, hybridization success, and analysis thresholds and success.

The use of such methods to determine expression of endometrial cancer nucleic acids from among SEQ ID NOs:1-50 and/or proteins from among SEQ ID Nos:51-100 can be done with routine methods known to those of ordinary skill in the art and the expression determined by protein measurement methods may be used as a prognostic method for selecting treatment strategies for endometrial cancer patients.

Examples

To establish a prognostic tool for designing endometrial cancer treatment regimens, expression patterns in primary endometrialcancer specimens were assessed and correlated with clinical outcome.

Tissue processing:

RNA isolated from normal cycling (proliferative, n=2; secretory, n=2) and neoplastic (endometrioid adenocarcinoma, n=10) human endometrial specimens was reverse transcribed and resultant cDNA used for in *vitro* transcriptional synthesis of fluorescently labeled nucleic acid probes according to manufacturer's instructions. Each resultant tissue-derived probe was then separately hybridized to an Affymetrix HuFL human expression array and hybridization images analyzed with Affymetrix software to generate a data matrix of named probes by quantitative expression level in each tissue.

Data Normalization:

Average differences for each sample were rescaled to sum to 3,000,000 over all genes. Then the average differences with an Affymetrix call of Absent or Marginal were set to 20, and average differences with a call of Present but with less than 20 were also set to 20. This resulted in a dataset truncated on the left tail at a value of 20, in which only genes determined to be "present" by the Affymetrix call were included as positive expression values.

Permax Test:

Standard pooled variance t-statistics comparing the 4 normal samples to the 10 tumor samples were computed separately for each gene from their log values. Log values were used because it is natural to think of differences between tissue types as a multiplicative effect or ratio increase/decrease. Only genes with at least 2 values > 20 were considered (3665 genes), since the t statistic is undefined for genes with all values = 20, and the statistic is either 1.69 or -.62 with only one value not equal to 20, regardless of the value.

The permutation distribution was used to assess the significance of t-statistics calculated for each gene in the dataset (Permax test). The customized program written in S-plus language to calculate Permax is a data analysis software tool for testing the significance of gene expression. It has been presented by Mutter, et al., 8th International Workshop on Chromosomes in Solid Tumors, Tucson, AZ, 2000; and is available online[2] at biowww.dfci.harvard.edu/~gray/permax.html and from Robert J. Gray, Department of Biostatistical Science, Dana-Farber Cancer Institute, 44 Binney Street Boston, MA 02115. Permax details enclosed therein are incorporated by reference herein.. In this approach all 1001 possible ways of dividing the 14 samples into two groups of sizes 4 and 10 were considered. For each of these, the t-statistics were computed for each gene. With unequal group sizes, these distributions are not symmetric, so the significance was assessed separately in each direction. To control the overall error rate, the distributions of the maximum and minimum t-statistics over the genes were used. That is, for each gene, the p-value in the direction with expression higher (lower) in normals is the proportion of permutations with the minimum (maximum) t statistic over all genes less than (greater than) or equal to the observed value for the particular gene. A test declaring as significant any genes with say $p<.50$ then guarantees that the chance of any false positives being selected is <50%.

The t statistics have a tendency to preferentially select genes with very small variances within a group. Because of this it may be appropriate to also require minimum criteria for differences between the group means. After determining the most significant genes from the t statistics, those genes with absolute differences between means <100, and ratios of means <3 were identified.

Table 1 is a spreadsheet identifying 50 genes which discriminate normal cycling from malignant endometrium.

Table 1

SEQ ID NO	GeneCode	Permax GPT	Fold GPT	Delta GPT	ChrBand	NLX GPT	TX GPT	AffyProbe Set	LocusLink	GenBank	ABREV	Title (from Unigene)
1	x6235	0.042	8.9	157.3	17q21	177	20	D88213_at	314	D88213	AOC2	amine oxidase, copper containing 2 (retina-specific)
2	x4535	0.2218	11.6	344.8	19q13.1	377	32	HG162-HT3165_at	558	M76125	AXL	AXL receptor tyrosine kinase
3	x2035	0.2727	45.9	898.1	11p15.5	20	918	M91083_at	8045	M91083	C11ORF13	chromosome 11 open reading frame 13
4	x3265	0.468	10.1	1590.5	12p13	1766	175	D13639_at	894	D13639	CCND2	cyclin D2
5	x3120	0.5	8.8	446.4	16q22.1	504	57	D21255_at	1009	D21255	CDH11	cadherin 11 (OB-cadherin, osteoblast)
6	x6580	0.2587	8.9	255.1	1p21	287	32	J04177_at	1301	J04177	COL11A1	collagen, type XI, alpha 1
7	x2140	0.1938	13.3	412.2	8q23	446	33	Y11710_rna1_at	7373	Y11710	COL14A1	collagen, type XIV, alpha 1; undulin
8	x1629	0.2038	8.9	158.8	2p21	179	20	U03688_at	1545	U03688	CYP1B1	cytochrome P450, subfamily I (dioxin-inducible), polypeptide 1 (glaucoma 3, primary infantile)
9	x3108	0.028	13.9	258.1	17p13.1	278	20	U83192_at	1742	U83192	DLG4	discs, large (Drosophila) homolog 4
10	x3342	0.426	6.5	3499.8	5q34	4140	640	X68277_at	1843	X68277	DUSP1	dual specificity phosphatase 1
11	x4985	0.2448	4.4	113.1	8	33	146	U15642_s_at	1875	U15642	E2F5	E2F transcription factor 5, p130-binding
12	x671	0.446	11.2	597.5	4	656	58	D11151_at	1909	D11151	EDNRA	endothelin receptor type A
13	x2341	0.2448	5.5	1078.6	8p21.1	242	1321	HG4535-HT4940_s_at	2039	U28389	EPB49	erythrocyte membrane protein band 4.9 (dematin)
14	x2797	0.0959	25.4	489.0	16p13.3-p13.11	20	509	L76568_xpt3_f_at	2072	L76568	ERCC4	excision repair cross-complementing rodent repair deficiency, complementation group 4
15	x6244	0.3057	3.1	750.5	13q14.1-q14.2	1103	353	M13450_at	2098	M13450	ESD	esterase D/formylglutathione hydrolase
16	x2404	0.2128	8.7	245.1	Xq22	277	32	X97249_at	2491	X97249	FSHPRH1	FSH primary response (LRPR1, rat) homolog 1
17	x4516	0.3247	39.1	761.3	3p21.3	20	781	U49082_at	10991	U49082	G17	G17 transporter protein
18	x4495	0.2218	55.8	3521.2	2p12-q11	3585	64	M85276_at	10578	M85276	GNLY	granulysin
19	x1222	0.014	16.5	310.3	2q14-q21	330	20	M36284_s_at	2995	M36284	GYPC	glycophorin C (Gerbich blood group)
20	x2590	0.1359	7.5	129.1	15q22	149	20	U50078_at	8925	U50078	HERC1	hect (homologous to the E6-AP

												(UBE3A) carboxyl terminus) domain and RCC1 (CHC1)-like domain (RLD) 1
21	x881	0.0599	10.3	185.2	2	205	20	U44111_at	3176	U44111	HNMT	histamine N-methyltransferase
22	x5023	0.2388	11.2	395.1	2q37.1-q36.3	434	39	X77307_at	3357	X77307	HTR2B	5-hydroxytryptamine (serotonin) receptor 2B
23	x2719	0.2108	7.9	206.0	9p22	236	30	J00212_f_at	3452	V00540	IFNA21	interferon, alpha 21
24	x5442	0.1618	42.3	1454.6	12q22-q23	1490	35	X57025_at	3479	X57025	IGF1	insulin-like growth factor 1 (somatomedin C)
25	x5452	0.5	6.2	420.4	19p13.1	501	81	U61263_at	10994	U61263	ILVBL	ilvB (bacterial acetolactate synthase)-like
26	x6197	0.1808	10.4	188.0	4q34.1-q35.1	208	20	X15949_at	3660	X15949	IRF2	interferon regulatory factor 2
27	x3700	0.3447	7.2	124.9	3q21-q25	145	20	D13626_at	9934	D13626	KIAA0001	KIAA0001 gene product
28	x1553	0.1728	3.7	3035.7	12q13	1115	4151	X12876_s_at	3875	X12876	KRT18	keratin 18
29	x5912	0.0669	10.2	4816.8	12q13	521	5338	X74929_s_at	3856	X74929	KRT8	keratin 8
30	x197	0.035	43.7	853.4	16q22.1	873	20	M12625_at	3931	M12625	LCAT	lecithin-cholesterol acyltransferase
31	x723	0.2478	5.8	7378.3	22q13.1	8915	1537	J04456_at	3956	J04456	LGALS1	lectin, galactoside-binding, soluble, 1 (galectin 1)
32	x1271	0.1299	3.8	1609.5	4q	583	2192	M93036_at	4072	M93036	M4S1	membrane component, chromosomal 4, surface marker (35kD glycoprotein)
33	x6752	0.431	4.0	613.2	14	818	205	Z24725_at	10979	Z24725	MIG2	mitogen inducible 2
34	x1469	0.2038	18.2	797.4	14q11-q12	844	46	Z48481_at	4323	Z48481	MMP14	matrix metalloproteinase 14 (membrane-inserted)
35	x879	0.2458	22.3	1149.7	1q43	1204	54	M30269_at	4811	M30269	NID	nidogen (enactin)
36	x1397	0.3946	11.6	724.8	5q14	793	68	HG3510-HT3704_at	7025	X12795	NR2F1	nuclear receptor subfamily 2, group F, member 1
37	x2831	0.2987	6.0	204.3	10q21.3-q23.1	41	245	M24486_s_at	5033	M24486	P4HA1	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha polypeptide 1
38	x2670	0.2478	158.2	4966.1	9q34	4998	32	HG721-HT4827_s_at	5047	J04129	PAEP(alt2)	progestagen-associated endometrial protein (placental protein 14, pregnancy-associated endometrial alpha-2-globulin, alpha uterine protein): Alternate Splice 2
39	x5757	0.2038	12.3	3977.7	7q22	4331	353	L33799_at	5118	L33799	PCOLCE	procollagen C-endopeptidase enhancer

40	x6701	0.3077	17.8	1101.4	4q11-q13	1167	65	M21574_at	5156	M21574	PDGFRA	platelet-derived growth factor receptor, alpha polypeptide
41	x6741	0.2068	5.1	120.6	Xq21-q27	150	29	D00860_at	5631	D00860	PRPS1	phosphoribosyl pyrophosphate synthetase 1
42	x1195	0.1099	10.2	183.7	Xp22.3-p22.2	204	20	Y00971_at	5634	Y00971	PRPS2	phosphoribosyl pyrophosphate synthetase 2
43	x5284	0.0789	11.6	212.7	4p15.31	233	20	M16447_at	5860	M16447	QDPR	quinoid dihydropteridine reductase
44	x320	0.4076	5.6	167.7	1p31-p22	204	37	X98001_at	5876	X98001	RABGGTB	Rab geranylgeranyltransferase, beta subunit
45	x6986	0.3417	13.9	628.3	10q11.1	677	49	L36033_at	6387	L36033	SDF1	stromal cell-derived factor 1
46	x1047	0.1988	3.7	297.9	5q31	408	110	Z11793_at	6414	Z11793	SEPP1	selenoprotein P, plasma, 1
47	x4685	0.2218	8.3	215.8	Xq28	245	30	X92396_at	6845	X92396	SYBL1	synaptobrevin-like 1
48	x5624	0.2228	3.1	666.3	15q13	988	321	L14837_at	7082	L14837	TJP1	tight junction protein 1 (zona occludens 1)
49	x4880	0.038	13.0	239.8	11p13	260	20	X69950_s_at	51352	X69950	WIT-1	Wilms tumor associated protein
50	x860	0.1508	13.9	323.7	7q22-q32	349	25	X98260_at	27000	X98260	ZRF1	zuotin related factor 1

Key:

SEQ ID NO	Sequence identifier number
GeneCode	Internal lab unique identifier, numbers preceded by an "x"
PermaxGPT	Permax value using GPT datastate
FoldGPT	Ratio of NLXGPT to TXGPT, inverted if needed to yield value >1
DeltaGPT	Arithmetic difference of NLXGPT and TXGPT , absolute value
ChrBand	Karyotypic locus of gene
NLXGPT	Mean expression in GPT units of 4 normal endometria
TXGPT	Mean expression in GPT units of 10 endometrioid endometrial adenocarcinomas
AffyProbeSet	Affymetrix probe identifier in HuFL human expression array chip
LocusLink	Locuslink ID number, when available.
GenBank	The GenBank entry for sequence used by Affymetrix to design probes
Abrev	When in full caps, this is the Locuslink recommended nomenclature.
Title	Text description of gene. Usually Locuslink label

References

1. Mutter, G. L., Baak, J. P. A., Cai, T., Fitzgerald, J., Gray, R., Gentleman, R., Gullans, S., Ibrahim, J., Neuberg, D., and Wilcox, M. Altered Gene Expression in Endometrioid Endometrial Adenocarcinomas Analyzed by High Density Microarrays. 8th International Workshop on Chromosomes in Solid Tumors (Tucson,AZ) . 2000. Ref Type: Abstract
2. Gray, R. Permax [On Line]. Available: http://biowww.dfci.harvard.edu/~gray/permax.html . 2000.
3. National Center for Biotechnology Information (USA): Unigene [Online]. Available: http://www ncbi nlm nih gov/UniGene/ 2000.
4. Wheeler DL, Chappey C, Lash AE, Leipe DD, Madden TL, Schuler GD, Tatusova TA, Rapp BA: Database resources of the National Center for Biotechnology Information. Nucleic Acids Res 2000, 28:10-14.
5. National Center for Biotechnology Information (USA): Locuslink [Online]. Available: http://www ncbi nlm nih gov/LocusLink/ 2000.
6. Pruitt KD, Katz KS, Sicotte H, Maglott DR: Introducing RefSeq and LocusLink: curated human genome resources at the NCBI. Trends Genet 2000, 16:44-47.
7. Harrison's Principles of Internal Medicine, 14/e, (1998) McGraw-Hill Companies, New York.
8. The Chipping Forecast (1999) Nature Genetics, 21(1):1-60.
9. Gwynne, P., and Page, G., (1999) Microarray Analysis: the next revolution in Molecular Biology, Science eMarketplace, Science, August 6. (sciencemag.org/feature/e-market/benchtop/micro.shl)
10. *Molecular Cloning: A Laboratory Manual*, (1989) J. Sambrook, et al., eds., Second Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
11. *Current Protocols in Molecular Biology*, (1999) F.M. Ausubel, et al., eds., John Wiley & Sons, Inc., New York.
12. Wagner et al., Nature Biotechnol. (1996) 14:840-844.
13. Sainio, K., Saarma, M., Nonclercq, D., Paulin, L., and Sariola, H. (1994) Antisense inhibition of low-affinity nerve growth factor receptor in kidney cultures: power and pitfalls.Cell Mol. Neurobiol. 14(5):439-457.

The present invention is not limited in scope by the examples provided, since the examples are intended as illustrations of various aspects of the invention and other functionally equivalent embodiments are within the scope of the invention. Various modifications of the invention in addition to those shown are described herein will become apparent to those skilled in the art for the foregoing description and fall within the scope of the appended claims. The advantages and objects of the invention are not necessarily encompassed by each embodiment of the invention.

All references, patents, and patent publications that are recited in this application are incorporated in their entirety herein by reference.

I claim:

Claims

1. A method for diagnosing endometrial cancer in a subject suspected of having endometrial cancer comprising:

obtaining from the subject an endometrial tissue sample suspected of being cancerous,

determining the expression of a set of nucleic acid molecules or expression products thereof in the endometrial tissue sample, wherein the set of nucleic acid molecules comprises at least two nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

2. The method of claim 1, wherein the set of nucleic acid molecules comprises at least 3 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

3. The method of claim 1, wherein the set includes at least 4 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

4. The method of claim 1, wherein the set includes at least 5 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

5. The method of claim 1, wherein the set includes at least 10 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

6. The method of claim 1, wherein the set includes at least 15 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

7. The method of claim 1, wherein the set includes at least 20 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

8. The method of claim 1, wherein the set includes at least 30 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

9. The method of claim 1, wherein the set includes at least 40 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

10. The method of claim 1, further comprising:

determining the expression of the set of nucleic acid molecules or expression products thereof in a non-cancerous endometrial tissue sample, and comparing the expression of the set of nucleic acid molecules or expression products thereof in the endometrial tissue sample suspected of being cancerous and the non-cancerous endometrial tissue sample.

11. A method for selecting a course of treatment of a subject having or suspected of having endometrial cancer, comprising:

obtaining from the subject an endometrial tissue sample suspected of being cancerous,

determining the expression of a set of nucleic acid markers or expression products thereof which are differentially expressed in endometrial tumor tissue samples, and

selecting a course of treatment appropriate to the endometrial cancer of the subject.

12. The method of claim 11 wherein the endometrial cancer is endometrioid endometrial carcinoma.

13. The method of claim 12, further comprising:

determining the expression of the set of nucleic acid molecules or expression products thereof in a non-cancerous endometrial tissue sample.

14. The method of claim 11, wherein the expression of a set of nucleic acid markers is determined by a method selected from the group consisting of nucleic acid hybridization and nucleic acid amplification.

15. The method of claim 14, wherein the nucleic acid hybridization is performed using a solid-phase nucleic acid molecule array.

16. A method for evaluating treatment of endometrial cancer, comprising:

obtaining a first determination of the expression of a set of nucleic acid molecules, or expression products thereof, which are differentially expressed in an endometrial tumor tissue sample from a subject undergoing treatment for cancer,

obtaining a second determination of the expression of a set of nucleic acid molecules, or expression products thereof, which are differentially expressed in a second endometrial tumor tissue sample from the subject after obtaining the first determination,

comparing the first determination of expression to the second determination of expression as an indication of evaluation of the treatment.

17. The method of claim 16, wherein the cancer is endometrioid endometrial adenocarcinoma.

18. The method of claim 17, further comprising:

determining the expression of a set of nucleic acid markers which are differentially expressed in non-cancerous endometrial tissue samples.

19. The method of claim 16, wherein the expression of a set of nucleic acid markers is determined by a method selected from the group consisting of nucleic acid hybridization and nucleic acid amplification.

20. The method of claim 16, wherein the nucleic acid hybridization is performed using a solid-phase nucleic acid molecule array.

21. A solid-phase nucleic acid molecule array consisting essentially of at least two nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50 fixed to a solid substrate.

22. The solid-phase nucleic acid molecule array of claim 21, further comprising at least one control nucleic acid molecule.

23. The solid-phase nucleic acid molecule array of claim 21, wherein the set of nucleic acid molecules comprises at least 3 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

24. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 4 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

25. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 5 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

26. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 10 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

27. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 15 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

28. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 20 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

29. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 30 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

30. The solid-phase nucleic acid molecule array of claim 21, wherein the set includes at least 40 nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50.

31. The solid-phase nucleic acid molecule array of claim 21, wherein the solid substrate comprises a material selected from the group consisting of glass, silica, aluminosilicates, borosilicates, metal oxides such as alumina and nickel oxide, various clays, nitrocellulose, or nylon.

32. The solid-phase nucleic acid molecule array of claim 21, wherein the nucleic acid molecules are fixed to the solid substrate by covalent bonding.

33. A solid-phase protein microarray comprising at least two antibodies or antigen-binding fragments thereof, that specifically bind at least two different polypeptides selected from the group consisting of SEQ ID NOs:51-100, fixed to a solid substrate.

34. The protein microarray of claim 33, wherein the microarray further comprises an antibody or antigen-binding fragment thereof, that binds specifically to a cancer-associated polypeptide other than those selected from the group consisting of SEQ ID NOs:51-100.

35. The protein microarray of claim 34, wherein the cancer-associated polypeptide other than those selected from the group consisting of SEQ ID NOs: 51-100 is a endometrial cancer associated polypeptide.

36. The protein microarray of claim 33, further comprising at least one control polypeptide molecule.

37. The protein microarray of claim 33, wherein the antibodies are monoclonal or polyclonal antibodies.

38. The protein microarray of claim 33, wherein the antibodies are chimeric, human, or humanized antibodies.

39. The protein microarray of claim 33, wherein the antibodies are single chain antibodies.

40. The protein microarray of claim 33, wherein the antigen-binding fragments are $F(ab')_2$, Fab, Fd, or Fv fragments.

41. A method for identifying lead compounds for a pharmacological agent useful in the treatment of endometrial cancer, comprising:

contacting a endometrial cancer cell or tissue with a candidate pharmacological agent,

determining the expression of a set of nucleic acid molecules in the endometrial cancer cell or tissue sample under conditions which, in the absence of the candidate pharmacological agent, permit a first amount of expression of the set of nucleic acid molecules wherein the set of nucleic acid molecules comprises at least two nucleic acid molecules selected from the group consisting of SEQ ID NOs:1-50, and

detecting a test amount of the expression of the set of nucleic acid molecules, wherein a decrease in the test amount of expression in the presence of the candidate pharmacological

agent relative to the first amount of expression indicates that the candidate pharmacological agent is a lead compound for a pharmacological agent which is useful in the treatment of endometrial cancer.

42. The method of claim 41, wherein the set of nucleic acid molecules is differentially expressed in endometrioid endometrial tumor tissue samples.

SEQUENCE LISTING

<110> The Brigham and Women's Hospital, Inc.

<120> PROGNOSTIC CLASSIFICATION OF ENDOMETRIAL CANCER

<130> B0801/7225WO

<150> US 60/221,735
<151> 2000-07-31

<160> 100

<170> PatentIn version 3.0

<210> 1
<211> 2572
<212> DNA
<213> Homo sapiens

<400> 1
tctgatttca cctctcagca tccaccatgc atctcaagat agtcctggcg ttcctggcac 60

tgtccctcat taccatcttt gccctggcct atgttttgct gaccagccca ggtggttcca 120

gccagcctcc ccactgcccc tctgtatccc atagggccca gccctggcca caccctggcc 180

agagccagct gtttgcagac ctgagccgag aggagttgac agctgtgatg cgctttctga 240

cccagcggct ggggccaggg ctggtggacg cagcccaggc tcagccctcg gacaactgca 300

tcttctcagt ggagctgcag ctgcccccca aggctgcagc cctggcccac ctggacaggg 360

ggagcccccc acctgcccgg gaggcactgg ccatcgtcct ctttggtgga caaccccaac 420

ccaatgtgag tgagctggtg gtggggccgc tgcctcaccc ctcgtacatg cgggatgtga 480

ctgtggagcg tcacggcggg cccctgccct atcaccgtcg cccggtgctg agagctgagt 540

ttacacagat gtggaggcat ctgaaagatg tggagctacc caaggcaccc atcttcctgt 600

cgtccacctt caactacaat ggctctaccc tggcagctgt gcatgccacc cctcggggct 660

tgcgctcaag ggaacgaact acctggattg gcctctacca taacatctca ggggttggtc 720

ttttccttca ccccgtgggg ctggagctac tactggacca cagggccctg gaccctgccc 780

actggactgt ccagcaggtc ttctaccttg ggcactacta tgcagacttg ggccagttgg 840

aacgggagtt taagtctggc cggttggaag tggttagagt ccctctacct ccaccaaatg 900

gagcttcatc cctgaggtct cggaactctc caggtcctct tccccctctt cagttctcgc 960

cccagggttc ccagtacagt gtgcaaggaa acctggtggt atcctccctc tggtcattta 1020

cctttggcca tggggtgttc agcggcctga ggatttttga tgttcggttc cagggtgagc 1080

gaatagccta tgaagtcagt gtccaggagt gtgtatctat ctatggtgcc gattcaccca 1140

agacgatgct gactcgctat ttggatagca gctttggact cggccgtaac agccgaggct 1200

tggtgcgggg agtggactgc ccctatcaag ccacgatggt ggacatccat atattagtgg 1260

gcaaaggggc agtccagctg cttccagggg ctgtgtgtgt atttgaggaa gcccagggac 1320

tgcccccttcg aaggcaccac aattaccttc aaaatcattt ctatggtggt ttggccagct 1380

cagcccttgt ggtcaggtct gtgtcatctg tgggcaacta tgactacatt tgggactttg 1440

tgttgtaccc aaatggggca cttgaagggc gggtccatgc cacgggttat atcaacacag 1500

ctttcctgaa agggggagag gagggcctcc tctttgggaa ccgtgtgggg gaaagagtgc 1560

tgggaacggt gcacacacat gccttccact tcaagctgga cctggatgtg gcagggctga 1620

aaaactgggt ggtagctgaa gacgtggtgt ttaaacctgt ggctgccccc tggaacccgg 1680

agcactggct acagcgccca cagctgactc ggcaggtcct gggaaaggag gacctgacag 1740

ctttttcctt gggaagcccc ctaccccgct acctctacct ggctagcaac cagactaatg 1800

cgtggggtca ccagcgcgga taccagcttg tggtgaccca gagaaaggag gaggagtcac 1860

agagcagtag catctatcac cagaatgaca tctggacacc cacagttacc tttgctgact 1920

tcatcaacaa tgaaaccctc ttaggagagg atctggtggc ttgggtcaca gccagcttcc 1980

tgcacattcc ccatgccgag gacatcccaa acacagtgac tctggggaac agagttggct 2040

tcttgctccg accctataac ttctttgatg aggacccctc catcttctcc cctggcagtg 2100

tgtactttga gaagggccag gatgctgggc tctgcagcat caatcctgtg gcctgcctcc 2160

ccgacctggc agcctgtgtc ccggacttac ccccttctc ttaccacggc ttctagtcct 2220

gagggtgtgg cgggcggcgt ggttaggcac atgtactttt ccctgtttct actttctatt 2280

ctccgtgttt ttatcacacc tgctccccag attcccaccc cctcaatgtt cctctcacac 2340

gaaaccccca tcagtccctt tggttaattc ttacttcctg ttcatctcta aagtgttaaa 2400

ttataaaaat gatttttaaa tattcaaaga aaaatatcac aaatcctact actcagaaat 2460

aggtggtcac attacatcag acatctcttt atgcatgtgc attcaaaagg aagagtagat 2520

agaattttgt aaaacagatg ttgtatgtaa tttataataa aaagtattaa ag 2572

<210> 2
<211> 3227
<212> DNA
<213> Homo sapiens

<400> 2
gctgggcaaa gccggtggca agggcctccc ctgccgctgt gccaggcagg cagtgccaaa 60

tccggggagc ctggagctgg ggggagggcc ggggacagcc cggccctgcc ccctcccccg 120

ctgggagccc agcaacttct gaggaaagtt tggcacccat ggcgtggcgg tgccccagga 180

tgggcagggt cccgctggcc tggtgcttgg cgctgtgcgg ctgggcgtgc atggccccca 240

ggggcacgca ggctgaagaa agtcccttcg tgggcaaccc agggaatatc acaggtgccc 300

ggggactcac gggcaccctt cggtgtcagc tccaggttca gggagagccc cccgaggtac 360

attggcttcg ggatggacag atcctggagc tcgcggacag cacccagacc caggtgcccc 420

tgggtgagga tgaacaggat gactggatag tggtcagcca gctcagaatc acctccctgc 480

agctttccga cacgggacag taccagtgtt tggtgtttct gggacatcag accttcgtgt 540

cccagcctgg ctatgttggg ctggagggct tgccttactt cctggaggag cccgaagaca 600

ggactgtggc cgccaacacc cccttcaacc tgagctgcca agctcaggga cccccagagc 660

ccgtggacct actctggctc caggatgctg tccccctggc cacggctcca ggtcacggcc 720

cccagcgcag cctgcatgtt ccagggctga acaagacatc ctctttctcc tgcgaagccc 780

ataacgccaa gggggtcacc acatcccgca cagccaccat cacagtgctc ccccagcagc 840

cccgtaacct ccacctggtc tcccgccaac ccacggagct ggaggtggct tggactccag 900

gcctgagcgg catctacccc ctgacccact gcaccctgca ggctgtgctg tcagacgatg 960

ggatgggcat ccaggcggga gaaccagacc ccccagagga gcccctcacc tcgcaagcat 1020

ccgtgccccc ccatcagctt cggctaggca gcctccatcc tcacacccct tatcacatcc 1080

gcgtggcatg caccagcagc cagggccccc catcctggac ccactggctt cctgtggaga 1140

cgccggaggg agtgcccctg ggccccccta agaacattag tgctacgcgg aatgggagcc 1200

aggccttcgt gcattggcaa gagccccggg cgcccctgca gggtaccctg ttagggtacc 1260

ggctggcgta tcaaggccag gacaccccag aggtgctaat ggacataggg ctaaggcaag 1320

aggtgaccct ggagctgcag ggggacgggt ctgtgtccaa tctgacagtg tgtgtggcag 1380

cctacactgc tgctggggat ggaccctgga gcctcccagt acccctggag gcctggcgcc 1440

cagtgaagga accttcaact cctgccttct cgtggccctg gtggtatgta ctgctaggag 1500

cagtcgtggc cgctgcctgt gtcctcatct tggctctctt ccttgtccac cggcgaaaga 1560

aggagacccg ttatggagaa gtgtttgaac caacagtgga aagaggtgaa ctggtagtca 1620

ggtaccgcgt gcgcaagtcc tacagtcgtc ggaccactga agctaccttg aacagcctgg 1680

gcatcagtga agagctgaag gagaagctgc gggatgtgat ggtggaccgg cacaaggtgg 1740

ccctggggaa gactctggga gagggagagt ttggagctgt gatggaaggc cagctcaacc 1800

aggacgactc catcctcaag gtggctgtga agacgatgaa gattgccatc tgcacgaggt 1860

cagagctgga ggatttcctg agtgaagcgg tctgcatgaa ggaatttgac catcccaacg 1920

tcatgaggct catcggtgtc tgtttccagg gttctgaacg agagagcttc ccagcacctg 1980

tggtcatctt acctttcatg aaacatggag acctacacag cttcctcctc tattcccggc 2040

tcggggacca gccagtgtac ctgcccactc agatgctagt gaagttcatg gcagacatcg 2100

ccagtggcat ggagtatctg agtaccaaga gattcataca ccgggacctg gcggccagga 2160

actgcatgct gaatgagaac atgtccgtgt gtgtggcgga cttcgggctc tccaagaaga 2220

tctacaatgg ggactactac cgccagggac gtatcgccaa gatgccagtc aagtggattg 2280

ccattgagag tctagctgac cgtgtctaca ccagcaagag cgatgtgtgg tccttcgggg 2340

tgacaatgtg ggagattgcc acaagaggcc aaaccccata tccgggcgtg gagaacagcg 2400

agatttatga ctatctgcgc cagggaaatc gcctgaagca gcctgcggac tgtctggatg 2460

gactgtatgc cttgatgtcg cggtgctggg agctaaatcc ccaggaccgg ccaagtttta 2520

cagagctgcg ggaagatttg gagaacacac tgaaggcctt gcctcctgcc caggagcctg 2580

acgaaatcct ctatgtcaac atggatgagg gtggaggtta tcctgaaccc cctggagctg 2640

caggaggagc tgacccccca acccagccag accctaagga ttcctgtagc tgcctcactg 2700

cggctgaggt ccatcctgct ggacgctatg tcctctgccc ttccacaacc cctagccccg 2760

ctcagcctgc tgataggggc tccccagcag ccccagggca ggaggatggt gcctgagaca 2820

accctccacc tggtactccc tctcaggatc caagctaagc actgccactg gggaaaactc 2880

caccttccca cttttccacc ccacgcctta tccccacttg cagccctgtc ttcctaccta 2940

tcccacctcc atcccagaca ggtccctccc cttctctgtg cagtagcatc accttgaaag 3000

cagtagcatc accatctgta aaaggaaggg gttggattgc aatatctgaa gccctcccag 3060

gtgttaacat tccaagactc tagagtccaa ggtttaaaga gtctagattc aaaggttcta 3120

ggtttcaaag atgctgtgag tctttggttc taaggacctg aaattccaaa gtctctaatt 3180

ctattaaagt gctaaggttc taaggcaaaa aaaaaaaaaa aaaaaaa 3227

<210> 3
<211> 1539
<212> DNA
<213> Homo sapiens

<400> 3
gaattcgggg ggaggggggca gtgtcctccg agccaggaca ggcatgttgt tgggactggc 60

ggccatggag ctgaaggtgt gggtggatgg catccagcgt gtggtctgtg gggtctcaga 120

gcagaccacc tgccaggaag tggtcatcgc actagcccaa gcaataggcc agactggccg 180

ctttgtgctt gtgcagcggc ttcgggagaa ggagcggcag ttgctgccac aagagtgtcc 240

agtgggcgcc caggccacct gcggacagtt tgccagcgat gtccagtttg tcctgaggcg 300

cacagggccc agcctagctg ggaggccctc ctcagacagc tgtccacccc cggaacgctg 360

cctaattcgt gccagcctcc ctgtaaagcc acgggctgcg ctgggctgtg agccccgcaa 420

aacactgacc cccgagccag cccccagcct ctcacgccct gggcctgcgg cccctgtgac 480

acccacacca ggctgctgca cagacctgcg gggcctggag ctcagggtgc agaggaatgc 540

tgaggagctg ggccatgagg ccttctggga gcaagagctg cgccgggagc aggcccggga 600

gcgagaggga caggcacgcc tgcaggcact aagtgcggcc actgctgagc atgccgcccg 660

gctgcaggcc ctggacgctc aggcccgtgc cctggaggct gagctgcagc tggcagcgga 720

ggcccctggg ccccccctcac ctatggcatc tgccactgag cgcctgcacc aggacctggc 780

tgttcaggag cggcagagtg cggaggtgca gggcagcctg gctctggtga gccgggccct 840

ggaggcagca gagcgagcct tgcaggctca ggctcaggag ctggaggagc tgaaccgaga 900

gctccgtcag tgcaacctgc agcagttcat ccagcagacc ggggctgcgc tgccaccgcc 960

cccacggcct gacaggggcc ctcctggcac tcagggccct ctgcctccag ccagagagga 1020

gtccctcctg ggcgctccct ctgagtccca tgctggtgcc cagcctaggc cccgaggtgg 1080

cccccatgac gcagaactcc tggaggtagc agcagctcct gccccagagt ggtgtcctct 1140

ggcagcccag ccccaggctc tgtgacagcc tagtgagggc tgcaagacca tcctgcccgg 1200

accacagaag gagagttggc ggtcacagag ggctcctctg ccaggcagtg ggaagccctg 1260

ggtttggcct caggagctgg gggtgcagtg ggggactgcc ctagtccttg ccaggtcgcc 1320

cagcaccctg gagaagcatg gggcgtagcc agctcggaac ttgccaggcc ccaaaggcca 1380

cgactgcctg ttggggacag gagatgcatg gacagtgtgc tcaagctgtg ggcatgtgct 1440

tgcctgcggg agaggtcctt cactgtgtgt acacagcaag agcatgtgtg tgccacttcc 1500

cctaccccaa cgtgaaaacc tcaataaact gcccgaagc 1539

<210> 4
<211> 6478
<212> DNA
<213> Homo sapiens

<400> 4
agagcgagca ggggagagcg agaccagttt taaggggagg accggtgcga gtaaggcagc 60

cccgaggctc tgctcgccca ccacccaatc ctcgcctccc ttctgctcca ccttctctct 120

ctgccctcac ctctcccccg aaaacccccct atttagccaa aggaaggagg tcaggggaac 180

gctctcccct ccccttccaa aaaacaaaaa cagaaaaacc cttttccagg ccggggaaag 240

caggagggag aggggccgcc gggctggcca tggagctgct gtgccacgag gtggacccgg 300

tccgcagggc cgtgcgggac cgcaacctgc tccgagacga ccgcgtcctg cagaacctgc 360

tcaccatcga ggagcgctac cttccgcagt gctcctactt caagtgcgtg cagaaggaca 420

tccaacccta catgcgcaga atggtggcca cctggatgct ggaggtctgt gaggaacaga 480

agtgcgaaga agaggtcttc cctctggcca tgaattacct ggaccgtttc ttggctgggg 540

tcccgactcc gaagtcccat ctgcaactcc tgggtgctgt ctgcatgttc ctggcctcca 600

aactcaaaga gaccagcccg ctgaccgcgg agaagctgtg catttacacc gacaactcca 660

tcaagcctca ggagctgctg gagtgggaac tggtggtgct ggggaagttg aagtggaacc 720

tggcagctgt cactcctcat gacttcattg agcacatctt gcgcaagctg ccccagcagc 780

gggagaagct gtctctgatc cgcaagcatg ctcagacctt cattgctctg tgtgccaccg 840

actttaagtt tgccatgtac ccaccgtcga tgatcgcaac tggaagtgtg ggagcagcca 900

tctgtgggct ccagcaggat gaggaagtga gctcgctcac ttgtgatgcc ctgactgagc 960

tgctggctaa gatcaccaac acagacgtgg attgtctcaa agcttgccag gagcagattg 1020

aggcggtgct cctcaatagc ctgcagcagt accgtcagga ccaacgtgac ggatccaagt 1080

cggaggatga actggaccaa gccagcaccc ctacagacgt gcgggatatc gacctgtgag 1140

gatgccagtt gggccgaaag agagagacgc gtccataatc tggtctcttc ttctttctgg 1200

ttgtttttgt tctttgtgtt ttagggtgaa acttaaaaaa aaaattctgc ccccacctag 1260

atcatattta aagatctttt agaagtgaga gaaaaaggtc ctacgaaaac ggaataataa 1320

aaagcatttg gtgcctattt gaagtacagc ataagggaat cccttgtata tgcgaacagt 1380

tattgtttga ttatgtaaaa gtaatagtaa aatgcttaca ggaaaacctg cagagtagtt 1440

agagaatatg tatgcctgca atatgggaac aaattagagg agacttttt tttcatgtta 1500

tgagctagca catacacccc cttgtagtat aatttcaagg aactgtgtac gccatttatg 1560

gcatgattag attgcaaagc aatgaactca agaaggaatt gaaataagga gggacatgat 1620

ggggaaggag tacaaaacaa tctctcaaca tgattgaacc atttgggatg gagaagcacc 1680

tttgctctca gccacctgtt actaagtcag gagtgtagtt ggatctctac attaatgtcc 1740

tcttgctgtc tacagtagct gctacctaaa aaaagatgtt ttattttgcc agttggacac 1800

aggtgattgg ctcctgggtt tcatgttctg tgacatcctg cttcttcttc caaatgcagt 1860

tcattgcaga caccaccata ttgctatcta atggggaaat gtagctatgg gccataacca 1920

aaactcacat gaaacggagg cagatggaga ccaagggtgg gatccagaat ggagtctttt 1980

ctgttattgt atttaaaagg gtaatgtggc cttggcattt cttcttagaa aaaaactaat 2040

ttttggtgct gattggcatg tctggttcac agtttagcat tgttataaac cattccattc 2100

gaaaagcact ttgaaaaatt gttcccgagc gatagatggg atggtttatg caagtcatgc 2160

tgaatactcc tcccctcttc tcttttgccc cctcccttcc tgcccccagt ctgggttact 2220

cttcgcttct ggtatctggc gttctttggt acacagttct ggtgttccta ccaggactca 2280

agagacaccc cttcctgctg acattcccat cacaacattc ctcagacaag cctgtaaact 2340

aaaatctgtt accatctgat ggcacagaag gatcttaatt cccatctcta tacttctcct 2400

ttggacatgg aaagaaaagt tattgctggt gcaaagatag atggctgaac atcagggtgt 2460

ggcattttgt tccctttcc gttttttttt tttttattgt tgttgttaat tttattgcaa 2520

agttgtattc agcgtacttg aatttttctt cctctccact tcttagaggc attcagttag 2580

caaagaggtt ggagcaacaa ctttttttt ttttttttgc acaattgtaa ttgacaggta 2640

atgaagctat ttgttaaaat atttgccttt ttaagtaaaa aagaaaaatc agaacagggc 2700

tatttgaaga attattttat acacagattc tgccttgttt catagtatga gggttgaaga 2760

cggaaaacaa tctaagggtc tctcattttt ttaattttgt tttgttcagt ttggtttttt 2820

ttttttttg cgctgctaag aagctaaagt catccatcct tattcacgtt gacagtacct 2880

agctgtaatg tttcacagag tgtgctgcta ttttataaac atttttataa tatattattt 2940

tactgcttaa attccaagtc ctgaagtaga tggttgagat atgagttctt cgtactggaa 3000

aagcccttcc gtagtttgtt ttcttctggt agcatattca tggttgtttt tttttttctt 3060

ttttggtttt ttggtttttt ttttttcctc tgatcacatt cttcaaagac ggagtattct 3120

tacctcaggt ttactggaca aaatcaataa ctacaaaagg caatgattca cgcttttgtt 3180

ttcataatac ctcacaaccg tacagtttct gcttgggagc ccattcgcat gaggaataca 3240

gaagcagtgt gagcagggct gactccctct caggtggaag gcagggcggt ctcactccca 3300

gggacctttt tggtcatgga ggccatcggg ctcccagtta gaccctggta tcctcatcat 3360

gatggaaaaa atacattgaa ccaagggatc ctccctcccc ttcaaggcag acgttcagta 3420

caaacattta tgcggtaggc tcagatgtcg taatttgcac ttaggtacca ggtgtcagga 3480

aacagactaa aaagaattcc accaggctgt ttggagatcc tcatcttgga gctttttcaa 3540

aagcggggct tcatctgcaa agggcccttt catcttgaag tttttccccc ccgtctttcc 3600

cctcccctgg catggacacc ttgtgtttag gatcatctct gcaggtttcc taggtctgaa 3660

tctgcgagta gatgaacctg cagcaagcag cgtttatggt gcttccttct ccctcctctg 3720

tctcaaactg cgcaggcaag cactatgcaa gcccaggccc tctgctgagc ggtactaaac 3780

ggtcgggttt tcaatcacac tgaattggca ggataagaaa aataggtcag ataagtatgg 3840

gatgatagtt gaagggaggt gaagaggctg cttctctaca gaggtgaaat tccagatgag 3900

tcagtctctt gggaagtgtg tttagaaggg ttcaggactt tgtgagttag catgacccta 3960

aaattctagg ggatttctgg tgggacaatg ggtggtgaat tttgaagttt tggagaggga 4020

agtggagcag ccagcaagta agctagccag agttttctca agagccagct ttgctcagca 4080

cactctcctg ggccccaagg agtcccacgg aatggggaaa gtgggaaccc tggagttctt 4140

gggaatcttg gagcctaaag agaaaccgag gtgcaaattc atttcatggt gactgaccct 4200

tgagcttaaa cagaagcagc aaatgaaaga accggacaaa taaggaaggg cacaagccta 4260

cccgactcta tttacagtct gtaactttcc actcttcctg tagtcccgag gcccctgggt 4320

ccttctagct tttctctttc ccatccttgg ggccttgtgt gatgatgggt gtggggctgc 4380

cgatgggaaa gtcgggggtt gttaggcttt tctgcctgct cctgcttaaa cacaagaagg 4440

aatcctggat tttgccctct ccttagctct tagtctcttt ggtaggagtt ttgttccaga 4500

ggagctctcc cccttggatt tgaacttgct ctttttgttg ttgttgttct ttctcttctt 4560

tttcttacct cccactaaag gggttccaaa ttatcctggt ctttttctac cttgttgtgt 4620

ttctatctcg tctttacttc catctgtttg ttttttttctc catcagtggg ggccgagttg 4680

ttcccccagc ctgccaaatt ttgatccttc ccctcttttg gccaaatcct agggggaaga 4740

aatcctagta tgccaaaaat atatgctaag cataattaaa ctccatgcgg gtccataaca 4800

gccaagaagc ctgcaggaga aagccaaggg cagttccctc cgcagaacac cccatgcgtg 4860

ctgagaggcg agctccttga agaaggggct gttcttccag gaggccttat tttgaactgc 4920

ctcaggaccc cactggagag cacagcatgc cttactactg ggtcatcctt ggtctatgtg 4980

ctctgtactg gaggctctgt tctgcctctt atcagccagg tcaggggcac acatggctta 5040

agtgacaaag ccagaggaga agacaaccct gacagcatca cgctgcatcc cattgctagc 5100

aggattggca actcttcaga cggagctgcg cttccctgca gtctagcacc tctagggcct 5160

ctccagactg tgccctggga gctctgggac tgaaaggtta agaacataag gcaggatcag 5220

atgactctct ccaagagggc aggggaattt tctctccatg ggccacaggg gacagggctg 5280

ggagaagaaa tagacttgca ccttatgtca tgtaaataat tgattttcta gttcaagaag 5340

ataatattgg tagtgtggga attggaggta ggaaggggag gaagtctgag taagccagtt 5400

ggcttctaag ccaaaaggat tcctctttgt ttatctctga gacagtccaa ccttgagaat 5460

agctttaaaa gggaaattaa tgctgagatg ataaagtccc cttaagccaa caaaccctct 5520

gtagctatag aatgagtgca ggtttctatt ggtgtggact cagagcaatt tacaagagct 5580

gttcatgcag ccatccattt gtgcaaaata gggtaagaag attcaagagg atatttatta 5640

cttcctcata ccacatggct tttgatgatt ctggattcta aacaacccag aatggtcatt 5700

tcaggcacaa cgatactaca ttcgtgtgtg tctgctttta aacttggctg ggctatcaga 5760

ccctattctc ggctcaggtt ttgagaagcc atcagcaaat gtgtacgtgc atgctgtagc 5820

tgcagcctgc atcccttcgc ctgcagccta ctttggggaa ataaagtgcc ttactgactg 5880

tagccattac agtatccaat gtcttttgac aggtgcctgt ccttgaaaaa caaagtttct 5940

atttttattt ttaattggtt tagttcttaa ctgctggcca actcttacat ccccagcaaa 6000

tcatcgggcc attggatttt ttccattatg ttcatcaccc ttatatcatg tacctcagat 6060

ctctctctct ctcctctctc tcagttatat agtttcttgt cttggacttt ttttttcttt 6120

tctttttctt ttttttttg ctttaaaaca agtgtgatgc catatcaagt ccatgttatt 6180

ctctcacagt gtactctata agaggtgtgg gtgtctgttt ggtcaggatg ttagaaagtg 6240

ctgataagta gcatgatcag tgtatgcgaa aaggttttta ggaagtatgg caaaaatgtt 6300

gtattggcta tgatggtgac atgatatagt cagctgcctt ttaagaggtc ttatctgttc 6360

agtgttaagt gatttaaaaa aataataacc tgttttctga ctagtttaaa gatggatttg 6420

aaaatggttt tgaatgcaat taggttatgc tatttggaca ataaactcac cttgacct 6478

<210> 5
<211> 3867
<212> DNA
<213> Homo sapiens

<400> 5
acaggcccgc gacgctcccc tcagctggcg gcggccgcgg agagatgccg cgggggccgc 60

tcgcagccgc cgctgacttg tgaatgggac cgggactggg gccgggactg acaccgcagc 120

gcttgccctg cgccagggac tggcggctcg gaggttgcgt ccaccctcaa gggccccaga 180

aatcactgtg ttttcagctc agcggccctg tgacattcct tcgtgttgtc atttgttgag 240

tgaccaatca gatgggtgga gtgtgttaca gaaattggca gcaagtatcc aatgggtgaa 300

gaagaagcta actggggacg tgggcagccc tgacgtgatg agctcaacca gcagagacat 360

tccatcccaa gagaggtctg cgtgacgcgt ccgggaggcc accctcagca agaccaccgt 420

acagttggtg gaaggggtga cagctgcatt ctcctgtgcc taccacgtaa ccaaaaatga 480

aggagaacta ctgtttacaa gccgccctgg tgtgcctggg catgctgtgc cacagccatg 540

cctttgcccc agagcggcgg gggcacctgc ggccctcctt ccatgggcac catgagaagg 600

gcaaggaggg gcaggtgcta cagcgctcca agcgtggctg ggtctggaac cagttcttcg 660

tgatagagga gtacaccggg cctgaccccg tgcttgtggg caggcttcat tcagatattg 720

actctggtga tgggaacatt aaatacattc tctcagggga aggagctgga accatttttg 780

tgattgatga caaatcaggg aacattcatg ccaccaagac gttggatcga gaagagagag 840

cccagtacac gttgatggct caggcggtgg acagggacac caatcggcca ctggagccac 900

cgtcggaatt cattgtcaag gtccaggaca ttaatgacaa ccctccggag ttcctgcacg 960

agacctatca tgccaacgtg cctgagaggt ccaatgtggg aacgtcagta atccaggtga 1020

cagcttcaga tgcagatgac cccacttatg gaaatagcgc caagttagtg tacagtatcc 1080

tcgaaggaca accctatttt tcggtggaag cacagacagg tatcatcaga acagccctac 1140

ccaacatgga cagggaggcc aaggaggagt accacgtggt gatccaggcc aaggacatgg 1200

gtggacatat gggcggactc tcagggacaa ccaaagtgac gatcacactg accgatgtca 1260

atgacaaccc accaaagttt ccgcagagcg tataccagat atctgtgtca gaagcagccg 1320

tccctgggga ggaagtagga agagtgaaag ctaaagatcc agacattgga gaaaatggct 1380

tagtcacata caatattgtt gatggagatg gtatggaatc gtttgaaatc acaacggact 1440

atgaaacaca ggaggggggtg ataaagctga aaaagcctgt agattttgaa accaaaagag 1500

cctatagctt gaaggtagag gcagccaacg tgcacatcga cccgaagttt atcagcaatg 1560

gcccttttcaa ggacactgtg accgtcaaga tcgcagtaga agatgctgat gagcccccta 1620

tgttcttggc cccaagttac atccacgaag tccaagaaaa tgcagctgct ggcaccgtgg 1680

ttgggagagt gcatgccaaa gaccctgatg ctgccaacag cccgataagg tattccatcg 1740

atcgtcacac tgacctcgac agatttttca ctattaatcc agaggatggt tttattaaaa 1800

ctacaaaacc tctggataga gaggaaacag cctggctcaa catcactgtc tttgcagcag 1860

aaatccacaa tcggcatcag gaagccaaag tcccagtggc cattagggtc cttgatgtca 1920

acgataatgc tcccaagttt gctgcccctt atgaaggttt catctgtgag agtgatcaga 1980

ccaagccact ttccaaccag ccaattgtta caattagtgc agatgacaag gatgacacgg 2040

ccaatggacc aagatttatc ttcagcctac cccctgaaat cattcacaat ccaaatttca 2100

cagtcagaga caaccgagat aacacagcag gcgtgtacgc ccggcgtgga gggttcagtc 2160

ggcagaagca ggacttgtac cttctgccca tagtgatcag cgatggcggc atcccgccca 2220

tgagtagcac caacaccctc accatcaaag tctgcgggtg cgacgtgaac ggggcactgc 2280

tctcctgcaa cgcagaggcc tacattctga acgccggcct gagcacaggc gccctgatcg 2340

ccatcctcgc ctgcatcgtc attctcctgg gttgcccaag cttaatggaa ccccctctc 2400

ccagggaaga catgagattg ctttatctgg gcttccagct gatgctattt tcctatgtta 2460

aagtaaacag aagattttgt cttctggggg tctttataaa acttcctttc ctctatgtgg 2520

tggctacaga gagtccaacc acacttacgt cattgtagta ttgtttgtga ccctgagaag 2580

gcaaaagaaa gaaccactca ttgtctttga ggaagaagat gtccgtgaga acatcattac 2640

ttatgatgat gaaggggtg gggaagaaga cacagaagcc tttgatattg ccaccctcca 2700

gaatcctgat ggtatcaatg gatttatccc ccgcaaagac atcaaacctg agtatcagta 2760

catgcctaga cctgggctcc ggccagcgcc caacagcgtg gatgtcgatg acttcatcaa 2820

cacgagaata caggaggcag acaatgaccc cacggctcct ccttatgact ccattcaaat 2880

ctacggttat gaaggcaggg gctcagtggc cgggtccctg agctccctag agtcggccac 2940

cacagattca gacttggact atgattatct acagaactgg ggacctcgtt ttaagaaact 3000

agcagatttg tatggttcca aagacacttt tgatgacgat tcttaacaat aacgatacaa 3060

atttggcctt aagaactgtg tctggcgttc tcaagaatct agaagatgtg taaacaggta 3120

ttttttaaa tcaaggaaag gctcatttaa aacaggcaaa gttttacaga gaggatacat 3180

ttaataaaac tgcgaggaca tcaaagtggt aaatactgtg aaataccttt tctcacaaaa 3240

aggcaaatat tgaagttgtt tatcaacttc gctagaaaaa aaaaacactt ggcatacaaa 3300

atatttaagt gaaggagaag tctaacgctg aactgacaat gaagggaaat tgtttatgtg 3360

ttatgaacat ccaagtcttt cttctttttt aagttgtcaa agaagcttcc acaaaattag 3420

aaaggacaac agttctgagc tgtaatttcg ccttaaactc tggacactct atatgtagtg 3480

catttttaaa cttgaaatat ataatattca gccagcttaa acccatacaa tgtatgtaca 3540

atacaatgta caattatgtc tcttgagcat caatcttgtt actgctgatt cttgtaaatc 3600

tttttgcttc tactttcatc ttaaactaat acgtgccaga tataactgtc ttgtttcagt 3660

gagagacgcc ctatttctat gtcattttta atgtatctat ttgtacaatt ttaaagttct 3720

tattttagta tacatataaa tatcagtatt ctgacatgta agaaaatgtt acggcatcac 3780

acttatattt tatgaacatt gtactgttgc tttaatatga gcttcaatat aagaagcaat 3840

ctttgaaata aaaaaagatt ttttttt 3867

<210> 6
<211> 6158
<212> DNA
<213> Homo sapiens

<220>
<221> Unsure
<222> (2434)..(2434)
<223> n = a, c, g or t/u

<400> 6
aaccatcaaa tttagaagaa aaagcccttt gacttttttcc ccctctcccc ccccaatggc 60

tgtgtagcaa acatccctgg cgataccttg gaaaggacga agttggtctg cagtcgcaat 120

ttcgtgggtt gagttcacag ttgtgagtgc ggggctcgga gatggagccg tggtcctcta 180

ggtggaaaac gaaacggtgg ctctgggatt tcaccgtaac aaccctcgca ttgaccttcc 240

tcttccaagc tagagaggtc agaggagctg ctccagttga tgtactaaaa gcactagatt 300

ttcacaattc tccagaggga atatcaaaaa caacgggatt ttgcacaaac agaaagaatt 360

ctaaaggctc agatactgct tacagagttt caaagcaagc acaactcagt gccccaacaa 420

aacagttatt tccaggtgga actttcccag aagacttttc aatactattt acagtaaaac 480

caaaaaaagg aattcagtct ttccttttat ctatatataa tgagcatggt attcagcaaa 540

ttggtgttga ggttgggaga tcacctgttt ttctgtttga agaccacact ggaaaacctg 600

ccccagaaga ctatcccctc ttcagaactg ttaacatcgc tgacgggaag tggcatcggg 660

tagcaatcag cgtggagaag aaaactgtga caatgattgt tgattgtaag aagaaaacca 720

cgaaaccact tgatagaagt gagagagcaa ttgttgatac caatggaatc acggtttttg 780

gaacaaggat tttggatgaa gaagtttttg agggggacat tcagcagttt ttgatcacag 840

gtgatcccaa ggcagcatat gactactgtg agcattatag tccagactgt gactcttcag 900

cacccaaggc tgctcaagct caggaacctc agatagatga gtatgcacca gaggatataa 960

tcgaatatga ctatgagtat ggggaagcag agtataaaga ggctgaaagt gtaacagagg 1020

gacccactgt aactgaggag acaatagcac agacggaggc aaacatcgtt gatgattttc 1080

aagaatacaa ctatggaaca atggaaagtt accagacaga agctcctagg catgtttctg 1140

ggacaaatga gccaaatcca gttgaagaaa tatttactga agaatatcta acgggagagg 1200

attatgattc ccagaggaaa aattctgagg atacactata tgaaaacaaa gaaatagacg 1260

gcagggattc tgatcttctg gtagatggag atttaggcga atatgatttt tatgaatata 1320

aagaatatga agataaacca acaagccccc ctaatgaaga atttggtcca ggtgtaccag 1380

cagaaactga tattacagaa acaagcataa atggccatgg tgcatatgga gagaaaggac 1440

agaaaggaga accagcagtg gttgagcctg gtatgcttgt cgaaggacca ccaggaccag 1500

caggacctgc aggtattatg ggtcctccag gtctacaagg ccccactgga ccccctggtg 1560

accctggcga taggggcccc ccaggacgtc ctggcttacc aggggctgat ggtctacctg 1620

gtcctcctgg tactatgttg atgttaccgt tccgttatgg tggtgatggt tccaaaggac 1680

caaccatctc tgctcaggaa gctcaggctc aagctattct tcagcaggct cggattgctc 1740

tgagaggccc acctggccca atgggtctaa ctggaagacc aggtcctgtg gggggcctg 1800

gttcatctgg ggccaaaggt gagagtggtg atccaggtcc tcagggccct cgaggcgtcc 1860

agggtccccc tggtccaacg ggaaaacctg gaaaaagggg tcgtccaggt gcagatggag 1920

gaagaggaat gccaggagaa cctggggcaa agggagatcg agggtttgat ggacttccgg 1980

gtctgccagg tgacaaaggt cacaggggtg aacgaggtcc tcaaggtcct ccaggtcctc 2040

ctggtgatga tggaatgagg ggagaagatg gagaaattgg accaagaggt cttccaggtg 2100

aagctggccc acgaggtttg ctgggtccaa ggggaactcc aggagctcca gggcagcctg 2160

gtatggcagg tgtagatggc cccccaggac caaaagggaa catgggtccc caaggggagc 2220

ctgggcctcc aggtcaacaa gggaatccag gacctcaggg tcttcctggt ccacaaggtc 2280

caattggtcc tcctggtgaa aaaggaccac aaggaaaacc aggacttgct ggacttcctg 2340

gtgctgatgg gcctcctggt catcctggga aagaaggcca gtctggagaa aaggggctc 2400

tgggtccccc tggtccacaa ggtcctattg gatnnccggg cccccgggga gtaaagggag 2460

cagatggtgt cagaggtctc aagggatcta aaggtgaaaa gggtgaagat ggttttccag 2520

gattcaaagg tgacatgggt ctaaaaggtg acagaggaga agttggtcaa attggcccaa 2580

gagggnaaga tggccctgaa ggacccaaag gtcgagcagg cccaactgga gacccaggtc 2640

cttcaggtca agcaggagaa aagggaaaac ttggagttcc aggattacca ggatatccag 2700

gaagacaagg tccaaagggt tccactggat tccctgggtt tccaggtgcc aatggagaga 2760

aaggtgcacg gggagtagct ggcaaaccag gccctcgggg tcagcgtggt ccaacgggtc 2820

ctcgaggttc aagaggtgca agaggtccca ctgggaaacc tgggccaaag ggcacttcag 2880

gtggcgatgg ccctcctggc cctccaggtg aaagaggtcc tcaaggacct cagggtccag 2940

ttggattccc tggaccaaaa ggccctcctg gaccaccagg aaggatgggc tgcccaggac 3000

accctgggca acgtggggag actggatttc aaggcaagac cggccctcct gggccagggg 3060

gagtggttgg accacaggga ccaaccggtg agactggtcc aataggggaa cgtgggtatc 3120

ctggtcctcc tggccctcct ggtgagcaag gtcttcctgg tgctgcagga aaagaaggtg 3180

caaagggtga tccaggtcct caaggtatct cagggaaaga tggaccagca ggattacgtg 3240

gtttcccagg ggaaagaggt cttcctggag ctcagggtgc acctggactg aaaggagggg 3300

aaggtcccca gggcccacca ggtccagttg gctcaccagg agaacgtggg tcagcaggta 3360

cagctggccc aattggttta cgagggcgcc cgggacctca gggtcctcct ggtccagctg 3420

gagagaaagg tgctcctgga gaaaaaggtc cccaagggcc tgcagggaga gatggagttc 3480

aaggtcctgt tggtctccca gggccagctg gtcctgccgg ctcccctggg gaagacggag 3540

acaagggtga aattggtgag ccgggacaaa aaggcagcaa gggtggcaag ggagaaaatg 3600

gccctcccgg tcccccaggt cttcaaggac cagttggtgc ccctggaatt gctggaggtg 3660

atggtgaacc aggtcctaga ggacagcagg ggatgtttgg gcaaaaaggt gatgagggtg 3720

ccagaggctt ccctggacct cctggtccaa taggtcttca gggtctgcca ggcccacctg 3780

gtgaaaaagg tgaaaatggg gatgttggtc catgggggcc acctggtcct ccaggcccaa 3840

gaggccctca aggtcccaat ggagctgatg gaccacaagg acccccaggt tctgttggtt 3900

cagttggtgg tgttggagaa aagggtgaac ctggagaagc aggaaaccca gggcctcctg 3960

gggaagcagg tgtaggcggt cccaaaggag aaagaggaga gaaaggggaa gctggtccac 4020

ctggagctgc tggacctcca ggtgccaagg ggccgccagg tgatgatggc cctaagggta 4080

acccgggtcc tgttggtttt cctggagatc ctggtcctcc tggggaactt ggccctgcag 4140

gtcaagatgg tgttggtggt gacaagggtg aagatggaga tcctggtcaa ccgggtcctc 4200

ctggcccatc tggtgaggct ggcccaccag gtcctcctgg aaaacgaggt cctcctggag 4260

ctgcaggtgc agagggaaga caaggtgaaa aaggtgctaa gggggaagca ggtgcagaag 4320

gtcctcctgg aaaaaccggc ccagtcggtc ctcagggacc tgcaggaaag cctggtccag 4380

aaggtcttcg gggcatccct ggtcctgtgg gagaacaagg tctccctgga gctgcaggcc 4440

aagatggacc acctggtcct atgggacctc ctggcttacc tggtctcaaa ggtgaccctg 4500

gctccaaggg tgaaaaggga catcctggtt taattggcct gattggtcct ccaggagaac 4560

aaggggaaaa aggtgaccga gggctccctg gaactcaagg atctccagga gcaaaagggg 4620

atgggggaat tcctggtcct gctggtccct taggtccacc tggtcctcca ggcttaccag 4680

gtcctcaagg cccaaagggt aacaaaggct ctactggacc cgctggccag aaaggtgaca 4740

gtggtcttcc agggcctcct gggcctccag gtccacctgg tgaagtcatt cagcctttac 4800

caatcttgtc ctccaaaaaa acgagaagac atactgaagg catgcaagca gatgcagatg 4860

ataatattct tgattactcg gatggaatgg aagaaatatt tggttccctc aattccctga 4920

aacaagacat cgagcatatg aaatttccaa tgggtactca gaccaatcca gcccgaactt 4980

gtaaagacct gcaactcagc catcctgact tcccagatgg tgaatattgg attgatccta 5040

accaaggttg ctcaggagat tccttcaaag tttactgtaa tttcacatct ggtggtgaga 5100

cttgcattta tccagacaaa aaatctgagg gagtaagaat ttcatcatgg ccaaaggaga 5160

aaccaggaag ttggtttagt gaatttaaga ggggaaaact gctttcatac ttagatgttg 5220

aaggaaattc catcaatatg gtgcaaatga cattcctgaa acttctgact gcctctgctc 5280

ggcaaaattt cacctaccac tgtcatcagt cagcagcctg gtatgatgtg tcatcaggaa 5340

gttatgacaa agcacttcgc ttcctgggat caaatgatga ggagatgtcc tatgacaata 5400

atccttttat caaaacactg tatgatggtt gtacgtccag aaaaggctat gaaaaaactg 5460

tcattgaaat caatacacca aaaattgatc aagtacctat tgttgatgtc atgatcagtg 5520

actttggtga tcagaatcag aagttcggat ttgaagttgg tcctgtttgt tttcttggct 5580

aagattaaga caaagaacat atcaaatcaa cagaaaatgt accttggtgc caccaaccca 5640

ttttgtgcca catgcaagtt ttgaataagg atgtatggaa aacaacgctg catatacagg 5700

taccatttag gaaataccga tgcctttgtg ggggcagaat cacagacaaa agctttgaaa 5760

atcataaaga tataagttgg tgtggctaag atggaaacag ggctgattct tgattcccaa 5820

ttctcaactc tccttttcct atttgaattt ctttggtgct gtagaaaaca aaaaaagaaa 5880

aatatatatt cataaaaaat atggtgctca ttctcatcca tccaggatgt actaaaacag 5940

tgtgtttaat aaattgtaat tattttgtgt acagttctat actgttatct gtgtccattt 6000

ccaaaacttg cacgtgtccc tgaattccgc tgactctaat ttatgaggat gccgaactct 6060

gatggcaata atatatgtat tatgaaaatg aagttatgat ttccgatgac cctaagtccc 6120

tttctttggt taatgatgaa attcctttgt gtgtgttt 6158

<210> 7
<211> 2823
<212> DNA
<213> Homo sapiens

<400> 7
tatgtaaggc ggccaaggct gacctggtat ttatggtgga tggatcctgg agcattggag 60

atgaaaattt caataagatc atcagctttc tatacagcac tgttggagcc ctgaacaaga 120

ttggcacaga tggaacccaa gttgcaatgg ttcagttcac tgatgatccc agaacagaat 180

ttaaactaaa tgcttacaaa accaaagaga ctcttcttga tgcaattaaa cacatttcat 240

acaaaggagg aaatacaaaa acaggaaaag caattaagta tgttcgagat accttgttca 300

ctgcagagtc aggtacaaga aggggcatcc caaaggttat cgtggttata actgatggaa 360

gatcacaaga tgatgtgaac aaaatctcca gggagatgca attagatggc tatagcattt 420

ttgcaattgg tgtggccgat gcagattact cggagttggt tagcattggc agtaagccca 480

gcgcacgcca tgtcttcttt gtggatgact ttgacgcctt taagaaaatc gaagatgagt 540

taattacttt tgtctgcgaa acagcatcag caacctgtcc agtggtacac aaggatggca 600

ttgatcttgc aggatttaag atgatggaaa tgtttggttt ggttgaaaaa gatttttcat 660

cagtggaagg ggtttctatg gagcctggta ccttcaatgt gtttccatgt taccaactcc 720

ataaagatgc cctggtttcc cagccaacca ggtacttgca cccagaagga ttgccctccg 780

actacacaat cagttttcta ttccggattc ttcctgacac tccacaggag ccatttgctc 840

tttgggagat tttaaataaa aattctgacc cattggttgg ggttatttta gacaatggtg 900

ggaaaactct aacatatttc aactatgacc agagtgggga ttttcaaact gttactttcg 960

aaggacctga aattaggaaa atttttttatg gaagctttca caagctacac attgttgtca 1020

gtgagacttt ggtcaaagtg gttattgact gcaagcaagt gggtgagaag gcaatgaacg 1080

catcagctaa tatcacgtca gatggtgtag aagtgctagg gaaaatggtt cgatcaagag 1140

gaccaggtgg aaactctgca ccgttccagt tacagatgtt tgatattgtt tgctccacat 1200

catgggccaa tacagacaaa tgctgtgaac ttccaggcct gagagatgat gagtcttgcc 1260

cagaccttcc ccattcctgc tcctgttctg aaaccaatga agtggctctg ggaccagcgg 1320

gcccaccagg tggtccagga ctccgaggac caaagggcca gcaaggtgaa ccgggtccaa 1380

agggaccaga tggccctcgg ggtgaaattg gtctgccagg acctcagggt ccacctggac 1440

ctcaaggacc aagtggtctg tccattcaag gaatgcccgg aatgccagga gaaaaaggag 1500

agaaaggaga tactggcctt ccaggtccac agggtatccc aggaggcgtt ggttcaccag 1560

gacgtgatgg ctcaccaggc cagaggggcc ttccgggaaa ggatggatcc tcgggacctc 1620

caggaccacc agggccaata ggcattcctg gcacccctgg agtcccaggg atcacaggaa 1680

gcatgggacc gcaaggcgcc ctgggaccac ctggtgtccc tggagcaaag ggggaacgag 1740

gagagcgggg tgacctgcag tctcaagcca tggtgagatc agtggcgcgt caagtatgcg 1800

aacagctcat ccagagtcac atggccaggt acactgccat cctcaaccag attcccagcc 1860

actcctcatc catccggact gtccaagggc ctcctgggga gcctgggagg ccaggctcac 1920

ctggagcccc tggtgaacaa ggacccccag gaacaccagg cttccccgga aatgcaggcg 1980

taccagggac cccaggagaa cgaggtctaa ctggtatcaa aggagaaaaa ggaaatccag 2040

gcgttggaac ccaaggtcca agaggccccc ctggaccagc aggaccttca ggggagagtc 2100

ggcctggcag ccctgggccc cctggctctc ctggaccaag aggcccacca ggtcatctgg 2160

gggttcctgg accccaaggt ccttctggcc agcctggata ttgtgacccc tcatcatgtt 2220

ctgcctatgg tgtgagagat ctgatcccct acaatgatta ccagcactga agtggaaatc 2280

ctccactctg gttccattgg ccccagacat ttagctgtgg atacagaact gtcctgtcaa 2340

ccaccaccac caccaagccc ctgcccctaa caatggacac tctgcttccc tgcttcttct 2400

gcatccctgc cttcccactt tcaaacctct tgcccactct gctccaaaca tgatggagtg 2460

ataacatcgg aacttaacca aatcatatat gtctatttta atagacactg actgctccat 2520

gtcagcctgg atagaggtat atgacgtgtg ccaagaattt atcccagact cccctgtgtg 2580

acagcttcat aataaagtta cttaactgtg cctcttcctc cttcctctcc ccacacagga 2640

tggatgggca tctttctcct tgaccaccct actctccctt cctcccctga tcacctcccc 2700

tccctgctct cccctggtga tggacttcta acatgagatt tttttaaaaa atttctattt 2760

cttttataat tttgctgagt tttcagggtt tcttctgtaa ataaaacata atatttaaaa 2820

aaa 2823

<210> 8
<211> 5102
<212> DNA
<213> Homo sapiens

<400> 8
gcttctgcga ctccagttgt gagagccgca agggcatggg aattgacgcc actcaccgac 60

ccccagtctc aatctcaacg ctgtgaggaa acctcgactt tgccaggtcc ccaagggcag 120

cggggctcgg cgagcgaggc acccttctcc gtccccatcc caatccaagc gctcctggca 180

ctgacgacgc caagagactc gagtgggagt taaagcttcc agtgagggca gcaggtgtcc 240

aggccgggcc tgcgggttcc tgttgacgtc ttgccctagg caaaggtccc agttccttct 300

cggagccggc tgtcccgcgc cactggaaac cgcacctccc cgcagcatgg gcaccagcct 360

cagcccgaac gacccttggc cgctaaaccc gctgtccatc cagcagacca cgctcctgct 420

actcctgtcg gtgctggcca ctgtgcatgt gggccagcgg ctgctgaggc aacggaggcg 480

gcagctccgg tccgcgcccc cgggcccgtt tgcgtggcca ctgatcggaa acgcggcggc 540

ggtgggccag gcggctcacc tctcgttcgc tcgcctggcg cggcgctacg gcgacgtttt 600

ccagatccgc ctgggcagct gccccatagt ggtgctgaat ggcgagcgcg ccatccacca 660

ggccctggtg cagcagggct cggccttcgc cgaccggccg gccttcgcct ccttccgtgt 720

ggtgtccggc ggccgcagca tggctttcgg ccactactcg gagcactgga aggtgcagcg 780

gcgcgcagcc cacagcatga tgcgcaactt cttcacgcgc cagccgcgca gccgccaagt 840

cctcgagggc cacgtgctga gcgaggcgcg cgagctggtg gcgctgctgg tgcgcggcag 900

cgcggacggc gccttcctcg acccgaggcc gctgaccgtc gtggccgtgg ccaacgtcat 960

gagtgccgtg tgtttcggct gccgctacag ccacgacgac cccgagttcc gtgagctgct 1020

cagccacaac gaagagttcg ggcgcacggt gggcgcgggc agcctggtgg acgtgatgcc 1080

ctggctgcag tacttcccca acccggtgcg caccgttttc cgcgaattcg agcagctcaa 1140

ccgcaacttc agcaacttca tcctggacaa gttcttgagg cactgcgaaa gccttcggcc 1200

cggggccgcc ccccgcgaca tgatggacgc ctttatcctc tctgcggaaa agaaggcggc 1260

cggggactcg cacggtggtg gcgcgcggct ggatttggag aacgtaccgg ccactatcac 1320

tgacatcttc ggcgccagcc aggacaccct gtccaccgcg ctgcagtggc tgctcctcct 1380

cttcaccagg tatcctgatg tgcagactcg agtgcaggca gaattggatc aggtcgtggg 1440

gagggaccgt ctgccttgta tgggtgacca gcccaacctg ccctatgtcc tggccttcct 1500

ttatgaagcc atgcgcttct ccagctttgt gcctgtcact attcctcatg ccaccactgc 1560

caacacctct gtcttgggct accacattcc caaggacact gtggtttttg tcaaccagtg 1620

gtctgtgaat catgacccag tgaagtggcc taacccggag aactttgatc cagctcgatt 1680

cttggacaag gatggcctca tcaacaagga cctgaccagc agagtgatga ttttttcagt 1740

gggcaaaagg cggtgcattg gcgaagaact ttctaagatg cagcttttc tcttcatctc 1800

catcctggct caccagtgcg atttcagggc caacccaaat gagcctgcga aaatgaattt 1860

cagttatggt ctaaccatta aacccaagtc atttaaagtc aatgtcactc tcagagagtc 1920

catggagctc cttgatagtg ctgtccaaaa tttacaagcc aaggaaactt gccaataaga 1980

agcaagaggc aagctgaaat tttagaaata ttcacatctt cggagatgag gagtaaaatt 2040

cagtttttt ccagttcctc ttttgtgctg cttctcaatt agcgtttaag gtgagcataa 2100

atcaactgtc catcaggtga ggtgtgctcc atacccagcg gttcttcatg agtagtgggc 2160

tatgcaggag cttctgggag attttttga gtcaaagact taaagggccc aatgaattat 2220

tatatacata ctgcatcttg gttatttctg aaggtagcat tctttggagt taaaatgcac 2280

atatagacac atacacccaa acacttacac caaactactg aatgaagaag tattttggta 2340

accaggccat ttttggtggg aatccaagat tggtctccca tatgcagaaa tagacaaaaa 2400

gtatattaaa caaagtttca gagtatattg ttgaagagac agagacaagt aatttcagtg 2460

taaagtgtgt gattgaaggt gataagggaa aagataaaga ccagaaattc ccttttcacc 2520

ttttcaggaa aataacttag actctagtat ttatgggtgg atttatcctt ttgccttctg 2580

gtatacttcc ttacttttaa ggataaatca taaagtcagt tgctcaaaaa gaaatcaata 2640

gttgaattag tgagtatagt ggggttccat gagttatcat gaattttaaa gtatgcatta 2700

ttaaattgta aaactccaag gtgatgttgt acctcttttg cttgccaaag tacagaattt 2760

gaattatcag caaagaaaaa aaaaaaagcc agccaagctt taaattatgt gaccataatg 2820

tactgatttc agtaagtctc ataggttaaa aaaaaaagtc accaaatagt gtgaaatata 2880

ttacttaact gtccgtaagc agtatattag tattatcttg ttcaggaaaa ggttgaataa 2940

tatatgcctt gtgtaatatt gaaaattgaa aagtacaact aacgcaacca agtgtgctaa 3000

aaatgagctt gattaaatca accacctatt tttgacatgg aaatgaagca gggtttcttt 3060

tcttcactca aattttggcg aatctcaaaa ttagatccta agatgtgttc ttatttttat 3120

aacatcttta ttgaaattct atttataata cagaatcttg ttttgaaaat aacctaatta 3180

atatattaaa attccaaatt catggcatgc ttaaatttta actaaatttt aaagccattc 3240

tgattattga gttccagttg aagttagtgg aaatctgaac attctcctgt ggaaggcaga 3300

gaaatctaag ctgtgtctgc ccaatgaata atggaaaatg ccatgaatta cctggatgtt 3360

ctttttacga ggtgacaaga gttggggaca gaactcccat tacaactgac caagtttctc 3420

ttctagatga ttttttgaaa gttaacatta atgcctgctt tttggaaagt cagaatcaga 3480

agatagtctt ggaagctgtt tggaaaagac agtggagatg aggtcagttg tgtttttaa 3540

gatggcaatt actttggtag ctgggaaagc ataaagctca aatgaaatgt atgcattcac 3600

atttagaaaa gtgaattgaa gtttcaagtt ttaaagttca ttgcaattaa acttccaaag 3660

aaagttctac agtgtcctaa gtgctaagtg cttattacat tttattaagc tttttggaat 3720

ctttgtacca aaattttaaa aaagggagtt tttgatagtt gtgtgtatgt gtgtgtgggg 3780

tgggggggatg gtaagagaaa agagagaaac actgaaaaga aggaaagatg gttaaacatt 3840

ttcccactca ttctgaatta attaatttgg agcacaaaat tcaaagcatg gacatttaga 3900

agaaagatgt ttggcgtagc agagttaaat ctcaaatagg ctattaaaaa agtctacaac 3960

atagcagatc tgttttgtgg tttggaatat taaaaaactt catgtaattt tattttaaaa 4020

tttcatagct gtacttcttg aatataaaaa atcatgccag tatttttaaa ggcattagag 4080

tcaactacac aaagcaggct tgcccagtac atttaaattt tttggcactt gccattccaa 4140

aatattatgc cccaccaagg ctgagacagt gaatttgggc tgctgtagcc tatttttta 4200

gattgagaaa tgtgtagctg caaaaataat catgaaccaa tctggatgcc tcattatgtc 4260

aaccaggtcc agatgtgcta taatctgttt ttacgtatgt aggcccagtc gtcatcagat 4320

gcttgcggca aaagaaagct gtgtttatat ggaagaaagt aaggtgcttg gagtttacct 4380

ggcttattta atatgcttat aacctagtta aagaaaggaa aagaaaacaa aaaacgaatg 4440

aaaataactg aatttggagg ctggagtaat cagattactg ctttaatcag aaaccctcat 4500

tgtgtttcta ccggagagag aatgtatttg ctgacaacca ttaaagtcag aagttttact 4560

ccaggttatt gcaataaagt ataatgttta ttaaatgctt catttgtatg tcaaagcttt 4620

gactctataa gcaaattgct tttttccaaa acaaaaagat gtctcaggtt tgttttgtga 4680

attttctaaa agctttcatg tcccagaact tagcctttac ctgtgaagtg ttactacagc 4740

cttaatattt tcctagtaga tctatattag atcaaatagt tgcatagcag tatatgttaa 4800

tttgtgtgtt tttagctgtg acacaactgt gtgattaaaa ggtatacttt agtagacatt 4860

tataactcaa ggataccttc ttatttaatc ttttcttatt tttgtacttt atcatgaatg 4920

cttttagtgt gtgcataata gctacagtgc atagttgtag acaaagtaca ttctggggaa 4980

acaacattta tatgtagcct ttactgtttg atataccaaa ttaaaaaaaa attgtatctc 5040

attacttata ctgggacacc attaccaaaa taataaaaat cactttcata atcttgaaaa 5100

aa 5102

<210> 9
<211> 3995
<212> DNA
<213> Homo sapiens

<400> 9
ggatccgcgg gacagatgag gaaggggctt aagtcactgc agccagaggg atggaggtgg 60

actgatggga gggcttctcc ggtggggtta gaagggaaaa gtagggaaag agaagtgtaa 120

ggtagatggc agaggcagag acatggaaag acagactcta gggttcctga tgatatctat 180

ctcggccaac acaaaaggga gggtacagtg gtgggggcac ccaagctagg gtgtgagtac 240

cctaagtgta ttcttctgag atgtaggcca ttcactaact cttggaacag ctacagtttc 300

acagtaggaa gacccccccа gattcactgc ccctccctta gtaaagcctc tgagaccttc 360

ctgaacattc ccttctgtct ttgccctctg ttccttccag agactatgtg cccaggcaga 420

tggattcctc ccgggcctga gaggaactgc aggaattctc ctgcctctta cccgtaaaac 480

cccaacttct ctagccctag ggcaggaagt cccaaacaat ttctaccccc ttttctgcaa 540

ttctcattgg ggtgagagga ggcccaggag gagagagagc tgggctcagc ttctttttga 600

gctgctggag ccctctgtga ggaggccctc tttgctggct tctcaggaga gtgtggctag 660

gttctgcctg cctatgggaa gaggggccа gggtgtgtgg agcaagatgg tgcggtgctg 720

gtgccttggg acctgggggа atgggacagc tggtcggctc agagacggcc tactttactc 780

acagctggaa tttagtgggg agaagcagct caactccaat cctggaggat tagggagatt 840

aaagtgagag aagagagaga tgtcccagag accaagagct cccaggtcag ccctctggct 900

cctggcaccc ccactgctgc ggtgggcacc cccactcctc acagtgctgc atagcgacct 960

cttccaggcc ttgctggaca tcctggacta ttatgaggct tccctctcag agagtcagaa 1020

ataccgctac caagatgaag acacgccccc tctggagcac agcccggccc acctcccaa 1080

ccaggccaat tctcccccag tgattgtcaa cacagatacc ctagaagccc caggatatga 1140

gttgcaggtg aacgggaccg agggggagat ggaatacgag gaaatcacat tggaaagggg 1200

taactcaggt ctgggcttca gcatcgcagg tggcactgac aacccacaca tcggtgacga 1260

cccatccatt ttcatcacca agatcattcc tggtggggct gcggcccagg atggccgcct 1320

cagggtcaac gacagcatcc tgtttgtaaa tgaagtggac gtgcgcgagg tgacccactc 1380

agcggcggtg gaagccctca aagaggcagg ctccatcgtt cgcctctatg tcatgcgccg 1440

gaagcccccg gctgagaagg tcatggagat caagctcatc aaggggccta aaggtcttgg 1500

cttcagcatc gcaggggggcg tagggaacca gcacatccca ggagataata gcatctatgt 1560

aacaaagatc atcgaagggg gtgctgccca caaggatggg aggttgcaga ttggagacaa 1620

gatcctggcg gtcaacagtg tggggctaga ggacgtcatg catgaagatg ctgtggcagc 1680

cctgaagaac acgtatgatg ttgtctacct aaaggtggcc aagcccagca atgcctacct 1740

gagtgacagc tatgctcccc cagacatcac aacctcttat tcccagcacc tggacaatga 1800

gatcagtcac agcagctacc tgggcaccga ctaccccaca gccatgaccc ccacttcccc 1860

tcggcgctac tctccagtgg ccaaggacct gctcggggag gaagacattc cccgagaacc 1920

gaggcgaatt gtgatccacc ggggctccac gggcctgggc ttcaacatcg tgggtggcga 1980

ggacggtgaa ggcatcttca tctcctttat cctggccggg ggccctgcag acctcagtgg 2040

ggagctgcgg aaggggggacc agatcctgtc ggtcaacggt gtggacctcc gaaatgccag 2100

ccatgagcag gctgccattg ccctgaagaa tgcgggtcag acggtcacga tcatcgctca 2160

gtataaacca gaagagtaca gccgattcga ggccaagatc cacgaccttc gggaacagct 2220

catgaacagc agcctgggct cagggactgc gtccttgcgg agcaacccca aaaggggttt 2280

ctacatcagg gccctgtttg attacgacaa gaccaaggac tgcggcttcc tgagccaggc 2340

cctgagcttc cgctttgggg atgtgctgca tgtcatcgat gctagtgatg aggagtggtg 2400

gcaggcacgg cgggtccact ctgacagtga gaccgacgac attgggttca tccccagcaa 2460

acggcgggtt gagcgacgag agtggtcaag gttaaaggcc aaggactggg gctccagctc 2520

tggatcgcag ggtcgagaag actcggttct gagctacgag acagtgacgc agatggaagt 2580

gcactatgct cgccccatca tcatccttgg gcccaccaag gaccgcgcca acgatgatct 2640

tctctccgag ttccccgaca agtttggatc ctgtgttccc catacgacac ggcccaagcg 2700

ggagtatgag atagatggcc gggattacca ctttgtgtcg tcccgggaga aaatggagaa 2760

ggacattcag gcgcacaagt tcattgaggc cggccagtac aacagccacc tctatgggac 2820

cagcgtccag tccgtgcgag aggtggcaga gcaggggaag cactgcatcc tcgatgtctc 2880

ggccaatgcc gtgcggcggc tgcaggcggc ccacctgcac cccatcgcca tcttcatccg 2940

cccccgctcc ctggagaatg tgctagagat taacaagcgg atcacagagg agcaagcccg 3000

caaagccttc gacagagcca ccaagctgga gcaggagttc acagagtgct tctcagccat 3060

cgtggagggt gacagctttg aggagatcta ccacaaggtg aagcgtgtca tcgaggacct 3120

ctcaggcccc tacatctggg ttccagcccg agagagactc tgattcctgc cctggcttgg 3180

cctggactcg ccctgcctcc atcacctggg cccttggtct ggactgaatt gcccaagccc 3240

ttggctcccc ccggcctccc tcccaccct tcttatttat ttcctttcta actggatcca 3300

gcctgttgga gggggacac tcctctgcat gtatccccgc accccagaac tgggctcctg 3360

aacgccagga acctggggtc tgggggggag ctgggctcct tgttccgagc ccttgctcct 3420

taggatcccc gcccccacct gcccccaatg cacacacaga cccaccgggg gccacctgcc 3480

ctcccccatc ctctcccaca cacattccag aagtcagggc cccctcgagg agcacccgct 3540

gcagggatgc agggccacag gcctccgctc tctcctaagg cagggtctgg ggtcacccct 3600

gcctcatcgt aattccccat gttaccttga tttctcattt atttttttcca ctttttttct 3660

tctcaaaggt ggtttttttgg ggggagaagc aggggactcc gcagcgggcc cctgccttcc 3720

acatgccccc accatttttc tttgccggtt tgcatgagtg gaaggtctaa atgtggcttt 3780

ttttttttt ttcctgggaa ttttttttggg gaaaagggag ggatgggtct agggagtggg 3840

aaatgcggga gggagggtgg ggcaggggtc gggggtcggg tgtccgggag ccagggaaga 3900

ctggaaatgc tgccgccttc tgcaatttat ttatttttt cttttgagag agtgaaagga 3960

agagacagat acttgaaaaa aaaaaaaaaa aaaaa 3995

<210> 10
<211> 2000
<212> DNA
<213> Homo sapiens

<400> 10
tttgggctgt gtgtgcgacg cgggtcggag gggcagtcgg gggaaccgcg aagaagccga 60

ggagcccgga gccccgcgtg acgctcctct ctcagtccaa aagcggcttt tggttcggcg 120

cagagagacc cgggggtcta gcttttcctc gaaaagcgcc gccctgccct tggccccgag 180

aacagacaaa gagcaccgca gggccgatca cgctgggggc gctgaggccg gccatggtca 240

tggaagtggg caccctggac gctggaggcc tgcgggcgct gctgggggag cgagcggcgc 300

aatgcctgct gctggactgc cgctccttct tcgctttcaa cgccggccac atcgccggct 360

ctgtcaacgt gcgcttcagc accatcgtgc ggcgccgggc caagggcgcc atgggcctgg 420

agcacatcgt gcccaacgcc gagctccgcg gccgcctgct ggccggcgcc taccacgccg 480

tggtgttgct ggacgagcgc agcgccgccc tggacggcgc caagcgcgac ggcaccctgg 540

ccctggcggc cggcgcgctc tgccgcgagg cgcgcgccgc gcaagtcttc ttcctcaaag 600

gaggatacga agcgttttcg gcttcctgcc cggagctgtg cagcaaacag tcgaccccca 660

tggggctcag ccttcccctg agtactagcg tccctgacag cgcggaatct gggtgcagtt 720

cctgcagtac cccactctac gatcagggtg gcccggtgga aatcctgccc tttctgtacc 780

tgggcagtgc gtatcacgct tcccgcaagg acatgctgga tgccttgggc ataactgcct 840

tgatcaacgt ctcagccaat tgtcccaacc attttgaggg tcactaccag tacaagagca 900

tccctgtgga ggacaaccac aaggcagaca tcagctcctg gttcaacgag gccattgact 960

tcatagactc catcaagaat gctggaggaa gggtgtttgt ccactgccag gcaggcattt 1020

cccggtcagc caccatctgc cttgcttacc ttatgaggac taatcgagtc aagctggacg 1080

aggcctttga gtttgtgaag cagaggcgaa gcatcatctc tcccaacttc agcttcatgg 1140

gccagctgct gcagtttgag tcccaggtgc tggctccgca ctgttcggca gaggctggga 1200

gccccgccat ggctgtgctc gaccgaggca cctccaccac caccgtgttc aacttccccg 1260

tctccatccc tgtccactcc acgaacagtg cgctgagcta ccttcagagc cccattacga 1320

cctctcccag ctgctgaaag gccacgggag gtgaggctct tcacatccca ttgggactcc 1380

atgctccttg agaggagaaa tgcaataact ctgggagggg ctcgagaggg ctggtcctta 1440

tttatttaac ttcacccgag ttcctctggg tttctaagca gttatggtga tgacttagcg 1500

tcaagacatt tgctgaactc agcacattcg ggaccaatat atagtgggta catcaagtcc 1560

atctgacaaa atggggcaga agagaaagga ctcagtgtgt gatccggttt ctttttgctc 1620

gcccctgttt tttgtagaat ctcttcatgc ttgacatacc taccagtatt attcccgacg 1680

acacatatac atatgagaat ataccttatt tatttttgtg taggtgtctg ccttcacaaa 1740

tgtcattgtc tactcctaga agaaccaaat acctcaattt ttgtttttga gtactgtact 1800

atcctgtaaa tatatcttaa gcaggtttgt tttcagcact gatggaaaat accagtgttg 1860

ggtttttttt tagttgccaa cagttgtatg tttgctgatt atttatgacc tgaaataata 1920

tatttcttct tctaagaaga cattttgtta cataaggatg actttttttat acaatggaat 1980

aaattatggc atttctattg 2000

<210> 11
<211> 1587
<212> DNA
<213> Homo sapiens

<400> 11
gcgcggaggc ccggcgtgac aagcggccca gactcccgtg ggcgccgcac acctgttgtt 60

tgcagcagcc agcgacccgc actaccgctc tcggcgggcg gggaagcggc cgcagcggag 120

ccgacccggc aggtggccgc gggcggggcc ggcgagcgaa agtgcgcggg ggcccgacca 180

ccgcggggcc gggacgcgac gcgatggcgg cggcagagcc cgcgagctcg ggccagcagg 240

cgccggcagg gcaggggcag ggccagcggc cgccgccgca gcctccgcag gcgcaagccc 300

cgcagccgcc cccgccgccg cagctcgggg gcgcgggggg cggcagcagc aggcacgaga 360

agagcctggg gctgctcact accaagttcg tgtcgctgct gcaggaggcc aaggacggcg 420

ttctggatct caaagcggct gctgatactt tggctgtgag gcaaaaaagg agaatttatg 480

atatcaccaa tgtcttagag ggaattgact tgattgaaaa aaagtcaaaa aacagtatcc 540

agtggaaagg tgtaggtgct ggctgtaata ctaaagaagt catagataga ttaagatatc 600

ttaaagctga aattgaagat ctagaactga aggaaagaga acttgatcag cagaagttgt 660

ggctacagca aagcatcaaa aatgtgatgg acgattccat taataataga ttttcctatg 720

taactcatga agacatctgt aattgcttta atggtgatac acttttggcc attcaggcac 780

cttctggtac acaactggag gtacccattc cagaaatggg tcagaatgga caaaagaaat 840

accagatcaa tctaaagagt cattcaggac ctatccatgt gctgcttata aataaagagt 900

cgagttcatc taagcccgtg gtttttcctg ttcccccacc tgatgacctc acacagcctt 960

cctcccagtc cttgactcca gtgactccac agaaatccag catggcaact caaaatctgc 1020

ctgagcaaca tgtctctgaa agaagccagg ctctgcagca gacatcagct acagatatat 1080

cttcaggatc tattagtgga gatatcattg atgagttaat gtcttctgac gtgtttcctc 1140

tcttaaggct ttctcctacc ccggcagatg actacaactt taatttagat gataacgaag 1200

gagtttgtga tctgtttgat gtccagatac taaattatta gattccatgg aaacttggga 1260

ctgttatcta cctctaactg tgtaacattt tagacttctt aataacctaa atatttaaaa 1320

taatgaatgt aacacctttt gttcactgat tctgaagtgt tcttccctaa tacttcttta 1380

cttcacaaaa cttcaaccat aaaaacaaag ggctctgatt gctttagggg ataagtgatt 1440

taatatccac aaacgtcccc actccccaaa agtaactata tctggatttc aacttttctt 1500

ctaattgtga atccttctgt ttttcttctt aaggaggaag taaggacact acaggtcatc 1560

aaaacagtgg ccaaggactc attactg 1587

<210> 12
<211> 2595
<212> DNA
<213> Homo sapiens

<400> 12
gtctgttcct tcccccagtc atgcctctgc tgctgctgtt accagtccaa aagtctgatg 60

acctcggtcc ccatgaacgg aacaagcatc cagtggaaga accacgatca aaacaaccac 120

aacacagacc ggagcagcca taaggacagc atgaactgac cacccttaga agcactcctc 180

ggtactccca taatcctctc ggagaaaaaa atcacaaggc aactgtgact ccgggaatct 240

cttctctgat ccttcttcct taattcactc ccacacccaa gaagaaatgc tttccaaaac 300

cgcaaggtag actggtttat ccacccacaa catctacgaa tcgtacttct ttaattgatc 360

taatttacat attctgcgtg ttgtattcag cactaaaaaa tggtgggagc tgggggagaa 420

tgaagactgt taaatgaaac cagaaggata tttactactt ttgcatgaaa atagagcttt 480

caagtacatg gctagctttt atggcagttc tggtgaatgt tcaatgggaa ctggtcacca 540

tgaaacttta gagattaacg acaagatttt ctacttttt taagtgattt tttgtccttc 600

agccaaacac aatatgggct caggtcactt ttatttgaaa tgtcatttgg tgccagtatt 660

ttttaactgc ataatagcct aacatgatta tttgaactta tttacacata gtttgaaaaa 720

aaaaagacaa aaatagtatt caggtgagca attagattag tattttccac gtcactattt 780

atttttttaa aacacaaatt ctaaagctac aacaaatact acaggccctt aaagcacagt 840

ctgatgacac atttggcagt ttaatagatg ttactcaaag aatttttaa gaactgtatt 900

ttatttttta aatggtgttt tattacaagg gaccttgaac atgttttgta tgttaaattc 960

aaaagtaatg cttcaatcag atagttcttt ttcacaagtt caatctgttt ttcatgtaaa 1020

ttttgtatga aaaatcaatg tcaagtacca aaatgttaat gtatgtgtca tttaactctg 1080

cctgagactt tcagtgcact gtatatagaa gtctaaaaca cacctaagag aaaaagatcg 1140

aatttttcag atgattcgga aattttcatt caggtatttg taatagtgac atatatatgt 1200

atatacatat cacctcctat tctcttaatt tttgttaaaa tgttaactgg cagtaagtct 1260

tttttgatca ttccctttc catataggaa acataatttt gaagtggcca gatgagttta 1320

tcatgtcagt gaaaaataat tacccacaaa tgccaccagt aacttaacga ttcttcactt 1380

cttggggttt tcagtatgaa cctaactccc caccccaaca tctccctccc acattgtcac 1440

catttcaaag ggcccacagt gacttttgct gggcattttc ccagatgttt acagactgtg 1500

agtacagcag aaaatctttt actagtgtgt gtgtgtatat atataaacaa ttgtaaattt 1560

cttttagccc atttttctag actgtctctg tggaatatat ttgtgtgtgt gatatatgca 1620

tgtgtgtgat ggtatgtatg gatttaatct aatctaataa ttgtgccccg cagttgtgcc 1680

aaagtgcata gtctgagcta aaatctaggt gattgttcat catgacaacc tgcctcagtc 1740

cattttaacc tgtagcaacc ttctgcattc ataaatcttg taatcatgtt accattacaa 1800

atgggatata agaggcagcg tgaaagcaga tgagctgtgg actagcaata tagggttttg 1860

tttggttggt tggtttgata aagcagtatt tggggtcata ttgtttcctg tgctggagca 1920

aaagtcatta cactttgaag tattatattg ttcttatcct caattcaatg tggtgatgaa 1980

attgccaggt tgtctgatat ttctttcaga cttcgccaga cagattgctg ataataaatt 2040

aggtaagata atttgttggg ccatatttta ggacaggtaa aataacatca ggttccagtt 2100

gcttgaattg caaggctaag aagtactgcc cttttgtgtg ttagcagtca aatctattat 2160

tccactggcg catcatatgc agtgatatat gcctataata taagccatag gttcacacca 2220

ttttgtttag acaattgtct ttttttcaag atgctttgtt tctttcatat gaaaaaaatg 2280

catttttataa attcagaaag tcatagattt ctgaaggcgt caacgtgcat tttatttatg 2340

gactggtaag taactgtggt ttactagcag gaatatttcc aatttctacc tttactacat 2400

cttttcaaca agtaactttg tagaaatgag ccagaagcca aggccctgag ttggcagtgg 2460

cccataagtg taaaataaaa gtttacagaa accttgcaag tgtctcttca tttttatgta 2520

gttttccata gaaaatgttt gttacataat gcctgttgca aacctctcct tagtaatatc 2580

ctggaaagca gttta 2595

<210> 13
<211> 2727
<212> DNA
<213> Homo sapiens

<400> 13
cacgagaaga caggaggaag aaagggagag agggccaggc agtcgcactg tgaacagaac 60

aggagaaggc gaagcggggc aaagttccct gcccaccgac gccagcctgc ttggatgact 120

tgcctcgttt cataattcac ttactgtctg caccagccgg cctcagcctg gctggaccct 180

gctgcctgtg tggcccggag ccagaggccc ccacactccc agctgctctt ctacagatgc 240

catcaacgag caggactctg ggtggctcca ctgtctaagc ctggagagtc accgccgagg 300

gatgaggacg cgccagcccg ggggaacgcg ccagctgctt tcgcggcccc aagcgcgcag 360

tgcccagcag ccgcgccgag cctgacacgc tgtcctctcc cctcgcgcac agggctctgc 420

gagtgacccg gcgggcgagc tccgtgctgc atggaacggc tgcagaagca accacttacc 480

tcccccggga gcgtgagccc ctcccgagat tccagtgtgc ctggctctcc ctccagcatc 540

gtggccaaga tggacaatca ggtgctgggc tacaaggacc tggctgccat ccccaaggac 600

aaggccatcc tggacatcga gcggcccgac ctcatgatct acgagcctca cttcacttat 660

tccctcctgg aacacgtgga gctgcctcgc cagcgcgagc gctcgctgtc acccaaatcc 720

acatcccccc caccatcccc agaggtgtgg gcggacagcc ggtcgcctgg aatcatctct 780

caggcctcgg cccccagaac cactggaacc ccccggacca gcctgcccca tttccaccac 840

cctgagacct cccgcccaga ttccaacatc tacaagaagc ctcccatcta taagcagaga 900

gagtccgtgg gaggcagccc tcagaccaag cacctcatcg aggatctcat catcgagtca 960

tccaagtttc ctgcagccca gcccccagac cccaaccagc cagccaaaat cgaaaccgac 1020

tactggccat gcccccccgtc tctggctgtt gtggagacag aatggaggaa gcggaaggcg 1080

tctcggaggg gagcagagga agaggaggag gaggaagatg acgactctgg agaggagatg 1140

aaggctctca gggagcgtca gagagaggaa ctcagtaagg ttacttccaa cttgggaaag 1200

atgatcttga aagaagagat ggaaaagtca ttgccgatcc gaaggaaaac ccgctctctg 1260

cctgaccgga cacccttcca tacctccttg caccagggaa cgtctaaatc ttcctctctc 1320

ccccgctatg gcaggaccac cctgagccgg ctacagtcca cagagttcag cccatcaggg 1380

agtgagactg gaagcccagg cctgcagaac ggagagggcc agagggggag gatggaccgg 1440

gggaactccc tgccctgtgt gctggagcag aagatctatc cctatgaaat gctagtggtg 1500

accaacaagg ggcgaaccaa gctgccaccg ggggtggatc ggatgcggct tgagaggcat 1560

ctgtctgccg aggacttctc aagggtattt gccatgtccc ctgaagagtt tggcaagctg 1620

gctctgtgga agcggaatga gctcaagaag aaggcctctc tcttctgatg gcccccacct 1680

gctccgggac ggcccccttа cccctgctgc ttcagggttt ttccccggcg ggttgggagg 1740

ggcaggaggt ggggtggaaa tagggtgggc tcctttcctc aggtagagtg gggggccaaa 1800

acctctgcag tccccggcag tgagctatgg actttcttcc ccctcacgag gctgggggcc 1860

tcctgctctc gtccctggcc ctccctgtac agggcaaagc cagtctgggc tctggcacac 1920

agagttcatg tttgccgccc tctccctgcc cctcacccca gaggtgagag gaatgagggg 1980

cattggtggt taggccggtt ggctgtcttg aacagctgga gggaagatgc aggggtggga 2040

agcggccagg cagaaagagc tccaggctct tgtgtcgccc acccagccct cccatactca 2100

ctcctgacag ctttcctgca ctgcagcttc ctgctcctct gactctagtg ggaacaggcc 2160

ccagctcagc ctccgcgagg gaggtcaccc ctccacttca gcttgccctg acctccgctc 2220

gcaaaccccg agcttccaag ccttttgctc cagccctgcg gcttccccag aagcctgggc 2280

ttagggtgga gatgccgcct acccgatcct ggccctccac ctgcctccag gccacgaaat 2340

gggaattcca gcactaagcc aggcaccggg cagaagctgg gccttccgcc tcccttggat 2400

ggggtcaaga ggccaggcct ggcacatttt ggagtgtcct ggctaccagc tctcacacct 2460

acacccacgc acccccтcac acactatgct ctctcaagaa tgtaatttat tgggggcccc 2520

ccagctgctt tcctcacctg cccctgccct accttacacc cccagcttga cttctttcca 2580

gtccacgtgg atataatgat atctatattt ttgcccaggt ctgggtattg ctcctgccca 2640

gaccctgaca tccctttcca ctgtgtgtgt gaccatgctg ggggaggggg actctgcttg 2700

gaattaaaag gttgctttgg gtcccta 2727

<210> 14
<211> 3857
<212> DNA
<213> Homo sapiens

<400> 14

ggaagagctt ccatggagtc agggcagccg gctcgacgga ttgccatggc gccgctgctg 60

gagtacgagc gacagctggt gctggaactg ctcgacactg acgggctagt agtgtgcgcc 120

cgcgggctcg gcgcggaccg gctcctctac cactttctcc agctgcactg ccacccagcc 180

tgcctggtgc tggtgctcaa cacgcagccg gccgaggagg agtattttat caatcagctg 240

aagatagaag gagttgaaca cctccctcgc cgtgtaacaa atgaaatcac aagcaacagt 300

cgctatgaag tttacacaca aggtggtgtt atatttgcga caagtaggat acttgtggtt 360

gacttcttga ctgatagaat accttcagat ttaattactg gcatcttggt gtatagagcc 420

cacagaataa tcgagtcttg tcaagaagca ttcatcttgc gcctctttcg ccagaaaaac 480

aaacgtggtt ttattaaagc tttcacagac aatgctgttg cctttgatac tggtttttgt 540

catgtggaaa gagtgatgag aaatcttttt gtgaggaaac tgtatctgtg gccaaggttc 600

catgtagcag taaactcatt tttagaacag cacaaacctg aagttgtaga aatccatgtt 660

tctatgacac ctaccatgct tgctatacag actgctatac tggacatttt aaatgcatgt 720

ctaaaggaac taaaatgcca taacccatcg cttgaagtgg aagatttatc tttagaaaat 780

gctattggaa aacctttga caagacaatc cgccattatc tggatccttt gtggcaccag 840

cttggagcca agactaaatc cttagttcag gatttgaaga tattacgaac tttgctgcag 900

tatctctctc agtatgattg tgtcacattt cttaatcttc tggaatctct gagagcaacg 960

gaaaaagctt ttggtcagaa ttcaggttgg ctgtttcttg actccagcac ctcgatgttt 1020

ataaatgctc gagcaagggt ttatcatctt ccagatgcca aaatgagtaa aaaagaaaaa 1080

atatctgaaa aaatggaaat taaagaaggg gaagaaacaa aaaaggaact ggtcctagaa 1140

agcaacccaa agtgggaggc actgactgaa gtattaaaag aaattgaggc agaaaataag 1200

gagagtgaag ctcttggtgg tccaggtcaa gtactgattt gtgcaagtga tgaccgaaca 1260

tgttcccagc tgagagacta tatcactctt ggagcggagg ccttcttatt gaggctctac 1320

aggaaaacct ttgagaagga tagcaaagct gaagaagtct ggatgaaatt taggaaggaa 1380

gacagttcaa agagaattag gaaatctcac aaaagaccta aagaccccca aaacaaagaa 1440

cgggcttcta ccaaagaaag aaccctcaaa aagaaaaaac ggaagttgac cttaactcaa 1500

atggtaggaa aacctgaaga actggaagag gaaggagatg tcgaggaagg atatcgtcga 1560

gaaataagca gtagcccaga aagctgcccg gaagaaatta agcatgaaga atttgatgta 1620

aatttgtcat cggatgctgc tttcggaatc ctgaaagaac ccctcactat catccatccg 1680

cttctgggtt gcagcgaccc ctatgctctg acaagggtac tacatgaagt ggagccaaga 1740

tacgtggttc tttatgacgc agagctaacc tttgttcggc agcttgaaat ttacagggcg 1800

agtaggcctg ggaaacctct gagggtttac tttcttatat acggaggttc aactgaggaa 1860

caacgctatc tcactgcttt gcggaaagaa aaggaagctt ttgaaaaact cataagggaa 1920

aaagcaagca tggttgtccc tgaagaaaga gaaggcagag atgaaacaaa cttagaccta 1980

gtaagaggca cagcatctgc agatgtttcc actgacactc ggaaagccgg tggccaggaa 2040

cagaatggta cacagcaaag catagttgtg gatatgcgtg aatttcgaag tgagcttcca 2100

tctctgatcc atcgtcgggg cattgacatt gaacccgtga ctttagaggt tggagattac 2160

atcctcactc cagaaatgtg cgtggagcgc aagagtatca gtgatttaat cggctcttta 2220

aataacggcc gcctctacag ccagtgcatc tccatgtccc gctactacaa gcgtcccgtg 2280

cttctgattg agtttgaccc tagcaagcct ttctctctca cttcccgagg tgccttgttt 2340

caggagatct ccagcaatga cattagttcc aaactcactc ttcttacact tcacttcccc 2400

agactacgga ttctctggtg cccctctcct catgcaacgg cggagttgtt tgaggagctg 2460

aaacaaagca agccacagcc tgatgcggcg acagcactgg ccattacagc agattctgaa 2520

acccttcccg agtcagagaa gtataatcct ggtccccaag acttcttgtt aaaaatgcca 2580

ggggtgaatg ccaaaaactg ccgctccttg atgcaccacg ttaagaacat cgcagaatta 2640

gcagccctgt cacaagacga gctcacgagt attctgggga atgctgcaaa tgccaaacag 2700

ctttatgatt tcattcacac ctcttttgca gaagtcgtat caaaaggaaa agggaaaaag 2760

tgaacagtga tggctgtttt cttatcccat gcctgtactt ttcagcggct ccttgccaga 2820

catcataggt cattattaat tattggtttg ctatttcatt cttttccaat gctcttaatg 2880

attgtacggt ggaccagaag ccaggattcc tctctgaact ctgcagttag gcatcacttg 2940

aacttgcctg tgcctgctct ttttcctccc tgcaccgtct atgccgggct tagcatgttt 3000

ctttttaaat gaggtttgtc aggatcaggt aaagttccta caagtgatta cagaaggtag 3060

aaactttacc tgatcctaac agatctcatt tagaaaggaa tatgctaagc ctggcatgga 3120

cggtgcaggg agggaaaaga gcaggcacaa gaaagctacc atttttaaca gtccttgtta 3180

tctagtgcaa cataaataac agtcttaatt gcacttatac ccatgtcctg tggctctcca 3240

aatctggtct ttgctgttgt gtctgctgga cgcttgaact gatgtttgtg taggaaatca 3300

tgttctgacc ctttgtctac aaaggagcct tctggaacac tgagaagaaa catctctttg 3360

ccattcctga ccagttctct ctaccacatt ttcttcagct ccatacttct gcctgtctgc 3420

tctaaggaaa tttcatggag ccttcctact actaattcaa gacagtctcc tcaaaaactg 3480

gttgactagt cttctaatga ccctaacata tgtagcatat actataattt cattgttcca 3540

aattagtatt tttaaagcaa aatgaattac ctgtttgcaa aagttaatga tgaaggagct 3600

cttagaattc tcaatttttg cacatattca gtctcctaat atcagagatc cctaagtcca 3660

gctggctagt tacagagttt tttcagactt cctcgtttct cagctcttat atcctaagac 3720

accagcatca tatcctctag aaatacaacc taattggcag tgagccgaga tcgcaccact 3780

gcacccctgc ctgggcgaca gagtgagact ttgtctctat tacaaaaaga aaagaaaaga 3840

aatacaacct aagctca 3857

<210> 15
<211> 1069
<212> DNA
<213> Homo sapiens

<400> 15
gaattcgggg caaaaagcaa tcagcaattg gacaggaaaa gaatggcatt gaagcagatt 60

tccagcaaca agtgctttgg gggattgcag aaagtttttg aacatgacag tgttgaacta 120

aactgcaaaa tgaaatttgc tgtctactta ccaccaaagg cagaaacagg aaagtgccct 180

gcatgtattg gctctccagg tttaacttgc acagagccaa aattttatca tcaaaatctg 240

gttatcatca gtctgcttca gaaccatttg tcttgttgtc attgctccag atacagccct 300

cgtgcgtgca atattaaagg tgaagatgag agctgggact ttgcgactgg tcgtggattt 360

tatgttgatg ccactgaaga tccttggaaa accaactaca gaatgtactc ttatgtcaca 420

gaggagcttc cccaactcat aaatgccaat tttccagtgg atccccaaag gatgtctatt 480

tttggccact ccatgggagg tcatggagct ctgatctgtg ctttgaaaaa tcctggaaaa 540

tacaaatctg tgtcagcatt tgctccaatt tgcaaccctg tactctgtcc ctggggcaaa 600

aaagccttta gtggatattt gggaacagat caaagtaaat ggaaggctta tgatgctacc 660

caccttgtga aatcctatcc aggatctcag ctggacatac taattgatca agggaaagat 720

gaccagtttc ttttagatgg acagttactc cctgataact tcatagctgc ctgtacagaa 780

aagaaaatcc ccgttgtttt tcgattgcaa gagggttatg atcatagcta ctacttcatt 840

gcaaccttta ttactgacca catcagacat catgctaaat acctgaatgc atgaaaaaac 900

tccaaataag agaatctctt caggattata aaagttgtaa aatgcaactg tattgctgag 960

caaaaaaaaa aaaaattcaa aacattggat tttatagtgc taaaagggct ttattctata 1020

gttgaatcac ctctgaataa agatataaaa cctaaaaaaa cccgaattc 1069

<210> 16
<211> 2570
<212> DNA
<213> Homo sapiens

<220>

<221> Unsure
<222> (779)..(779)
<223> n = a, c, g or t/u

<400> 16
acaaagtctt gctctgtcac ccaggctgga gtgcagtggc gcaatcacgg ctctctgcag 60

cctcgacctc cgrggctcaa gctattctcc tgcctcaccc tcctgagtag atgggactac 120

aggtacgtgc ggctatctag ctaatttttt aaatcttaag tagagacatt ggtctcactg 180

tgttgcccag actggtcttg aactcctagg ttgaagggat cttccagcct ctgcctcccg 240

aagtgctgta ttacagaaca tatgcagtaa tgtcacctca aaagagagtt aagaacgtcc 300

aggcacaaaa caggacttca caaggtagta gtagttttca gaccacgctt tcagcctgga 360

aagtaaaaca ggatccaagc aactcgaaga acatctcaaa acatggacaa aacaatccag 420

tgggagatta tgaacatgct gatgatcaag ctgaagaaga tgctttgcaa atggcagtgg 480

gatattttga gaaaggtccc attaaagctt cacagaataa agataaaacc ttggaaaaac 540

acttgaaaac tgtggaaaat gtggcttgga agaatgggtt agcttcagaa gaaattgata 600

ttctattaaa tattgcactc agtggcaaat ttggaaatgc tgtaaacaca cggatattga 660

agtgcatgat cccagcaaca gtaatatcag aagattctgt ggttaaggca gtctcctggc 720

tttgtgttgg caagtgttct ggtagcacca aggtactttt ttatcgttgg ctggttgcna 780

tgtttgactt cattgatcgy aaggagcaaa ttaacttgct ctatggcttc ttttttgctt 840

cattgcaaga tgatgcactg tgcccttatg tttgccattt gttatattta cttacgaaaa 900

aagagaatgt caaaccattt cgtgtgagaa aactgcttga tcttcaggcc aaaatgggaa 960

tgcagcctca tctccaggct ttgttgtcac tgtataagtt ctttgctcct gctctgattt 1020

cagtatcttt gcctgtaagg aagaagatat atcttcagaa ttcagagaat ctatggaaga 1080

cggctctgct tgccgtgaag caaagaaacc ggggaccttc tccagaacct ctgaagttga 1140

tgttaggtcc agctaatgtt cgtcctctaa aaagaaagtg gaattctctc tcagttatac 1200

cagtgctcaa ttccagtagc tacactaaag aatgtggaaa aaaagagatg agtctttctg 1260

attgtctgaa tagaagtgga tcatttccac tagaacaact tcaaagcttc ccccaacttt 1320

tacagaacat ccattgctta gagctgcctt ctcagatggg ctcagtgcta aacaactctc 1380

tgctgcttca ctacattaac tgtgtcagag atgagccagt cttgctgagg tttcattact 1440

ggttgagtca aacattacaa gaagaatgta tttggtacaa ggtgaataat tatgaacatg 1500

gaaaagaatt taccaacttc ctggatacca tcatcagggc agagtgcttc ttacaagagg 1560

ggtattattc ctgtgaagca ttcctgtata agagccttcc tctctgggat ggccttagtt 1620

gtcggtcaca gttccttcag cttgtgagct ggattccttt tagtagcttc tctgaggtga 1680

aaccacttct ttttgaccat ctagcgcagc tcttctttac atcaaccatt tatttcaagt 1740

gtagtgtgct tcagagtctg aaagagctat tgcagaattg gctgttgtgg ctttctatgg 1800

acattcacat gaaacctgtt acraacagtc ctctagagac aactttgggt ggatccatga 1860

actgtgtgtc taaactgatc cactatgtag ggtggctatc cactactgca atgcgcttgg 1920

agagcaacaa tactttcttg ctgcacttta ttttggattt ctatgagaag gtgtgtgaca 1980

tatatataaa ttatgacctt ccattagtgg tattgtttcc tcctgggatc ttctattctg 2040

cactcctcag cctggatacc agcatcctga accagctgtg ttttattatg cacagatatc 2100

gtaaaaattt gactgccgca aagaaaaatg agttggtaca aaagacaaaa tcagagttca 2160

atttcagcag caagacttat caagaattta attactattt gacatcaatg gttggttgcc 2220

tgtggacgtc caaacccttt gcgaaaggaa tatatattga ccctgaaatc ctagaaaaaa 2280

ctggagtggc tgaatataaa aacagtttaa atgtagtcca tcatccttct ttcttgagtt 2340

acgctgtttc ctttttgcta caggaaagcc cagaagaaag gacagtaaac gtgagctcta 2400

tycggggaaa gaaatggagc tggtatttgg actatttatt ttcacagggg ttacaaggct 2460

tgaaactttt tataagaagt agtgttcatc attcttccat tcccagagca gagggcataa 2520

actgcaacaa tcaatattaa atgaatgttg acataaactg aaaaaaaaaa 2570

<210> 17
<211> 2431
<212> DNA
<213> Homo sapiens

<400> 17
ggcacgaggc cgggagcaga gcgaaccgca ccggcccgag cggagcgccg cacgttccca 60

accgcgaggc cagacatctg actgttggtg tgagaccagt gctcctggtg gtgtgccctg 120

agccatggag gcgcctttgc agacagagat ggtggagctg gtgcccaatg gcaaacactc 180

agaggggctg ctcccggtca tcacccccat ggcaggcaac cagagggtcg aggaccctgc 240

acggagctgt atggagggca agagcttcct acagaaaagt cccagcaagg agccacactt 300

cactgacttc gaggggaaga catcattcgg gatgtcagtg ttcaacctca gcaatgccat 360

catgggcagc ggcatcctgg gactcgccta tgccatggcc aatacgggca ttatcctttt 420

cctgttcctg ttgacagctg tcgccttgct ctccagctac tccatccacc tgctactcaa 480

gtcctcaggg gtcgtgggca tccgtgccta tgagcagctg ggctaccgtg cctttgggac 540

cccaggaaag ctggcagcag ccctggccat cacgctccag aacatcggag ccatgtccag 600

ctacctgtac atcatcaagt ctgagctgcc acttgtcata cagaccttcc tgaacctgga 660

ggagaaaacc tcggactggt acatgaacgg gaactacctg gtaatccttg tctctgtcac 720
catcattctg cccctggcac tgatgcggca gcttggctac ctgggctact ccagcggctt 780
ctctcttagc tgcatggtgt tcttcctaat tgcagtcatc tacaaaaagt tccacgtgcc 840
ctgcccactg ccccccaact tcaacaacac cacaggcaac ttcagccacg tggagatcgt 900
gaaggagaag gtgcagctgc aggtcgagcc tgaggcttca gccttctgca ctcccagcta 960
cttcacgctc aactcacaga cagcatacac catccccatc atggccttcg ccttcgtctg 1020
ccaccccgag gtgctgccca tctatactga gctcaaggac ccctccaaga agaagatgca 1080
gcacatctcc aacctgtcca tcgctgtcat gtacatcatg tacttcctgg ctgccctctt 1140
cggctacctc accttctaca acggggtgga gtcggagctg ctgcacacct acagcaaggt 1200
ggacccgttt gacgtcctga tcctgtgtgt gcgcgtggcc gtgctgacag cagtcacgct 1260
cacagtgccc atcgttctgt tcccggtgcg ccgcgccatc cagcagatgc tgtttccaaa 1320
ccaggagttc agctggctgc ggcatgtgct tattgccgtt ggcctgctca cttgtatcaa 1380
cctgctggtc atctttgccc ccaacatcct gggcatcttt ggggtcatcg gtgccacatc 1440
tgccccattc ctcatcttca tcttccctgc catcttctac ttccgaatca tgcccacgga 1500
gaaggagcct gcaagatcca cccccaaaat cctggccctg tgttttgcta tgcttggctt 1560
cttgctgatg accatgagct tgagcttcat catcattgac tgggcctcag ggaccagccg 1620
gcatggagga aaccactagg gtgaccctca tcctgttctg tctactcacc ctagcagccc 1680
tgcccagact cttcagcccc tgctcccatc cagtggccag tcgggggagg agaaagacgc 1740
gattaacact gtggcattca gccaggcccc atgtcctctc tgtggaaggt ttttgttcaa 1800
gagccaggac caaggcccct gggccactac cctgctaggc tctggagctg tagaggcttc 1860
ctgaactggg agcagggtag ggctgtcgcc ttagatcccg cccaagcccc tcattccctc 1920
cttgcacaga tgcatacact ggggcccagc agctgcctcc tgaggtgaca cagcctgtag 1980
gaacatacac agctgggatc agcctgcagc catcccccga ccctgctgct aggccacggt 2040
ctgcgccctg gggcctcatc tcccccagcc cacttgtttt ccccccttttt attccctagg 2100
ccctttttcag actcctgggc ccttggatac tcttctccca tctcccttca caggatgaca 2160
ccctcccata ccccatagct ggggccagca ggttctgctg agggtggggc tggtgtaggg 2220
acccccaaga gacccctgtc ctgtcccttc accagtcctg gggaggctgg gactcccccct 2280
gccacaagcc tgggccacag ctcacattcc actgctggga gaagaaacag gccgaggccc 2340
agagtggcct gcccccggga gccaaagacc ccagtggcca cactgggata gggtggggag 2400
gctggcagcc ctcttttata aatctcgtgc c 2431

<210> 18
<211> 6746
<212> DNA
<213> Homo sapiens

<400> 18
ctgcagtgtt tggtctcacc aagtttccca caataaagag acatgagtca cctttcaaga 60

ccctttaccc ccaagaatgt ggtcttcaca catgagacca aggtctacaa gtggtcagga 120

gagaggggt ctgctcagat gggggagtag tgcctgagct ggcctcaaga gggttaagtg 180

gccctgcact gaaaacctgg acactgagtt agggtagggc tgggggaaaa cttgggcttt 240

ggagtcgtag ggtctgggtt caaatccaca gaccattccc ttcctagctg tgtgttggtg 300

ggtaattcac tggatctttc tgagtcctgg tttcctcatc tgaggtaaaa cgagtttgcc 360

ggttggtctg agagctgttc taggcatggt ggggagaccc tgacaggcag aggcagccct 420

gctctcaagc agttgattta cagctgggga aacaagacag ccacaaatgc aatacctcaa 480

actcaacttc tcaccagaaa gctccttttc ctaattttca cagccagtcc ctcagcctcc 540

tgggccccaa atactagtaa aacctttgcc tcctctctct tctttctttc ttgtaatcat 600

ataggtacaa agtcctacca attcttcctg aaatatgttt ccttatcaaa aagtcctgca 660

aagccgtgcg tggttgctca tgcctataat cccagcactt tggaggctgg gaggatcgct 720

tgagtccagg agttcgagac cagcctggac aacatatgga gacccatctc taccaaaaat 780

tttaaaatca gcaggggtgg tagtggcaag cacctgtggt ctcatctact tgggaggctg 840

aggtgggggg attgttggag cctgggcggt tgaggctgca gtgatctgtg attgcaccac 900

tgcactctag cctgagggac agagcaagaa cttgtatcag aaaaaaaaaa aaaaagtcct 960

gcggtactgg acactgccat tgcctatacg attcccactc cctcatcctc cctagcagga 1020

tatcaatttt gttcgaagtg tcaatgaagg ccaggtgcgg tggctgatgc ctgtaatcct 1080

aacactttgg gaggccgagg caggcggatc acctgaggtc aggagttcaa gaccagcctg 1140

gccaacatgg tgaaaccctg tctctactaa aaacacacaa attagcaggg catggtggcg 1200

tgcacctgta atcccagcta ctcaggaggc tgagacagga gaatcacttg aacccggagt 1260

ggaggttgca atcagccaag atcacaccac tgcacttcag cttgggtgac aagagtgaaa 1320

ctctgtctca aaaaagaaaa acaaaacaaa aacaaacaac aacaacaaaa agcaaagtgt 1380

cagtgaaggt ccagcaaaag actcccttcc tattgccctt tgcagccagg gtcatcatgt 1440

gacacagttc agatcaatga gatggaggct gagggtccct gggaaagatg tttttcctat 1500

acaggtacca cctctttcag cttcactctt tccattttcc acgtgaacag gccttgtagc 1560

ctggaggagc tacagctgcc tttttgagat gctgaggcac cctgtctgaa gaaggccctc 1620

acatcactca acttgactac tgggtgagcc cttggagagg cttcccagcc tctgctcttc 1680

aagccgaagt accacagggg acacgagtcc cagagttaca ggaccccagc tatggttcat 1740

gtgtaaaggg aaccattagg caaccagggg aaatgatgaa gaagatctac atttacaaat 1800

gtggaaagat gttcgtggta tattgttaaa ttaaaaagct gtttaaaaat agtttttggg 1860

tcaagtgaga tgactcactt atacttttag tataagtatg tcccatgcaa tatctggaac 1920

gtacttgtac taaggggttt ctccctccat cggcacatcc caggcatcct ggcagctgct 1980

ggcctccagc aaccccacat tctagttgtg tgggagtggg ttgtggcatg gaccctgtgg 2040

gctaccactg ccctgacctg cttcttcaca cactggtatt tgtatctgtg gtaaacccag 2100

tgacacgggg gagatgacat acaaaaaggg caggacctga gaaagattaa gctgcaggct 2160

ccctgcccat aaaacagggt gtgaaaggca tctcagcggc tgccccacca tggctacctg 2220

ggccctcctg ctccttgcag ccatgctcct gggcaaccca ggtaaggcct tcccctcggg 2280

atcgatcctg atggcccacc cagcctcgca ctctcaggct ggctgaacct ggagcttgga 2340

ctctgtgggc acccaggtgc ccctgcctcc ccccggcctt ctcccccgtc atggaggcct 2400

ggccctcccc tcagagccag gcttagtccg gtgtgctgcc cagcctgtca ctggcctggc 2460

caaggaggag agacaggcca gggattctgg tcctaactct actggccaca ctgtgtggcc 2520

tgagacccca ctttccctcc caagcccctg cctccgcatc tgcgtggtga aggccattgg 2580

cctcatcggt ggatctgcgt ttcctcgggc ctacactgtc taggattgtg cggggctggt 2640

gagagaacaa gatctcttcc gtgttcaagg cagacttcct gccccctgca ccctgctctc 2700

tcccaggcct tgaggtcagt gtgagcccca agggcaagaa cacttctgga agggagagtg 2760

gatttggctg ggccatctgg atggaaggta aaaaaagaaa atcccttgaa aggagattga 2820

gggaagtttc tagacaaacc gacccccaaa tctgtgttgc tgggggaaca gaggagaaga 2880

gagagtctcg ccctcctggc tttctagaag gaacgtgaga acacgtgttt gtgctgagag 2940

tgggtcagag cggctccagg gcaaagcatg tggacaggta tcctggcccc ctgcaaggcc 3000

cagctcctgt cctaggccct ggtcacctcc tggactccca ccagccagga gaacgggctt 3060

tccctctcct tccgcctgcg gaggggaagc tgaagtctgg tcttcctcag gtctggtctt 3120

ctctcgtctg agccctgagt actacgacct ggcaagagcc cacctgcgtg atgaggagaa 3180

atcctgcccg tgcctggccc aggagggccc ccaggtacgt gttggctctc tgctcacctg 3240

ccacagtccc tctcctttcc ctcctccctg gtggctcctg gggtgaggtc tggagctctc 3300

taatggtcag gaggtgggag tggaggctgg gctgtttctg acgatgctgg ttttgttgaa 3360

ttcatgtctg gccaggaggg ctacaggtat ctggcagact cctccaggag gatcctctgg 3420

ggtctcaccc tccaaggagc ctggggctgc agaacccaaa taggcagact cccctgggag 3480

ttcctcaata ggagaggggc aagtgcaggg ctgggaaagt actggggttg tgggaggctg 3540

tttctggggt gtctcagagc ctctaagaca agcaaaaggg tgggtagggg ccaggcagcc 3600

agttcaggcc ttcagtgtat ccacgctctg ggaagagatc acggacattc ctgccggcct 3660

cagaaacaca aagggcccct ttcctgggca ctttcacgcg ctcccagagt gtctgagaga 3720

ccatcataag ggctttcttt cctgacaggg tgacctgttg accaaaacac aggagctggg 3780

ccgtgactac aggacctgtc tgacgatagt ccaaaaactg aagaagatgg tggataagcc 3840

cacccaggtg aggccaaggg gctacagagc ctcctgtctg ctgctcaatg gaggggccag 3900

cctgtgacca ggtcggggat cggggagccc gggggcacct tgcacagtga tcctggggga 3960

gggcttccta gaagggaatc tgtgagtccc cgtgtgtctg tggatgaatt tcagagaact 4020

tgtgaaattg tgactctctg gaactgtgta agtcagacgg cagagtatac atggttttca 4080

tcatgtatcc tcaaagaggg cttgtcccag agaagttagg aatcttcccc taaagcccta 4140

acatttgtgt ccaaggcaga gtttgagaag ctagttcccc aagaggcctg ggtcaggact 4200

gataaatccc agatctgcta cttccaagct gcatggcctt gggcaagtca cttccacttt 4260

ctgagcccct gttatcttat ctttgaaatg tgatggataa tagtccctat cttgcaagtt 4320

gtcaaaccct ttttttttt tttccttgag ataggatctt actctgagac ccaggctgga 4380

gtgcactggt gtgatcttgg ctcactgcaa cctctgcctc cctggcccaa gcaattctcc 4440

tgtctaagcc tcctgagtac ctggggctcc aggtgtgcgc caccatgccc agctaatttt 4500

tgtacttttg tagaaacagg gtctcactgt gttgcccagg ctggtctcca acttctgagc 4560

tgaagcaatc cacctgcctt ggcctcccaa agtgtgggat tataggcatg agccactgca 4620

cctggctgct gaagcttttt aaaagagctg agggctggga tgtgcttagc tccacgtcca 4680

gcactgagta aatgcttaac gaatgactgt gttactacca agaattattg tttcactctc 4740

cctccttccc tctcctctgc tgccccaaac tactcagcat cctggcactg caggctcgca 4800

cttagccctg gatacccaga ttcatcctcc tcccctggga tggcatagaa gagactttaa 4860

aaccaaatga gccaagactc caagctctga ccacacctcc caccccacc agtcttctct 4920

atgcaccccc tctatatctg gagcccccag ccaggttctg gaccaaggta gctacatggc 4980

agagcattta atgtgtgcct ggcagccatg ggcaccattc tccacacaga aggcagggac 5040

aggtgcacaa ggggctgaga ccccagcagg gctaactgtc cttgtctcag gagccctacc 5100

tggccagtct tgggccaggc cttggggact gggagtaggg gctgacccgt ctgtacagtc 5160

tctggcccca tggcaccagg tgccagctcc tcgcacccag tactcccatt gctagggctg 5220

ctggaacctg cagggttggc agagctgggc aggactcacc ctataaccat gtccactgtg 5280

gtgctgctgc tgcagagaag tgtttccaat gctgcgaccc gggtgtgtag gacggggagg 5340

tcacgatggc gcgacgtctg cagaaatttc atgaggaggt atcagtctag agttatccag 5400

ggcctcgtgg ccggagaaac tgcccagcag atctgtgagg acctcaggtt gtgtatacct 5460

tctacaggtg agtgcagagg tgacagcagg gatacctcct gagggttgga gacagcttcc 5520

cccaggatat atcaaagctg cctccttact cccccatctc ccagcatggg aaagtgtgga 5580

gaattgagca gatggacttt agctagaaat gtttgagaaa tactgattag agcttgggct 5640

tcagacacag gtggttgtgg agtaaaatct ggtctccatc tctccctggc tgtgtgacct 5700

taagcaaata acttgacctc tctgagcttc agtttcttca tctgtgaagg agagatagca 5760

atcctgattt ttgagattgg aatgagaatt gaaggaggtc accgtgtgtg tggacctgac 5820

cctggggaaa tgtcctcaga ctgaggctat tcaaggtcat cagaccctca gtcaaactcc 5880

aacccagccc agcacatggc ccctggggtc gggagctggg gccatatcct cccccacaat 5940

cctgggccct gagatctggg ctagggaacc cttcaggcag gggagcatga ggcctttccc 6000

tccatggctg cccaggctgt gctgagagaa cagatctcgg ctgtaggaaa cggggccaga 6060

aaggggcctc ggtgattggc tctggcagct cagctggcac ttgccaatag ctctgggatt 6120

ttatgctggc agatcggggg tccccaccat ttcctgtcat tggagcttgt ggcttttcta 6180

ttcaaggccc cacagcctgc tcaggctgcc gactggcttc caggatgtgc ctctgggtgt 6240

gttcagtagg gtcaggtggc tctgggacct taagcaagta acattctgag tgcctgcttc 6300

tccttgagga cccaccacat ctgcccacag ctagctgttc tctccgctcc aggtcccctc 6360

tgagccctct caccttgtcc tgtggaagaa gcacaggctc ctgtcctcag atcccgggaa 6420

cgtcagcaac ctctgccggc tcctcgcttc ctcgatccag aatccactct ccagtctccc 6480

tcccctgact ccctctgctg tcctcccctc tcaggagaat aaagtgtcaa gcaagatttt 6540

agccgcagct gcttcttctt tggtggattt gaggggtggg tgtcagtggc atgctggggt 6600

gagctgtgta gtccttcaat aaatgtctgt cgtgtgtccc atacactgtt gtagatgtta 6660

tggatttagt ggtgaacgag acaaccttaa cagcattcac acagttagtc gtgaaatgct 6720

tactgagcac tcaccacagc catgca 6746

<210> 19
<211> 915
<212> DNA
<213> *Homo sapiens*

<400> 19
atgtggtcga cgagaagccc caacagcacg gcgtggcctc tcagcctcga gcctgatccg 60

gggatggcct ctgcctccac cacaatgcat actaccacca ttgcagagcc tgatccaggg 120

atgtctggat ggccggatgg cagaatggag acctccaccc ccaccataat ggacattgtc 180

gtcattgcag gtgtgattgc tgctgtggcc atcgtcctag tctccctcct cttcgtcatg 240

ctgcgctaca tgtaccggca caagggcacg taccacacca atgaggccaa gggcacggag 300

tttgctgaga gtgcagatgc agccctgcag ggagaccctg ccctccaaga tgctggtgat 360

agcagcagaa aggagtactt tatttgaggg acaacagact tcacttccct gaatgcctcc 420

cccatctcca tcaggaaaaa tacaccccat cgcccagtat ccccgtcgat accaccagac 480

agagagagag agtacacttg atttcttccc gagatagtta cctagaaaca ctaggtgcct 540

gcccaaggag gaacggagga ggactcgcgc tacaagaggc cactcccagg gacccaggga 600

ggcgatggcc accccagagg ccacctttтg ctccacggag gtgggagaga atctgggcac 660

atggggcccc ctagggcagt gcaggacaac atcagctcac tggcaggaaa gtccttgttg 720

agggtgaggg ggtgctgggg tacccggggg ctggggaagc aaggaaataa gtcatctgta 780

tgctgactgg ggataatggc atcaatgtca gtccttgact ttgggggggaa cagcaggtgc 840

cagagctaaa aggtaccttt gtctgccatt gatccagcta agaacgattg gaaataaatt 900

ggaaatgtaa ccgag 915

<210> 20
<211> 15164
<212> DNA
<213> Homo sapiens

<400> 20
gaattccgcc tctgcggagc cgggctcggg tcgccggagc cgcgccccac cccgccagct 60

ccagagccac gactaatggc tgaaggataa atcaacatgg caactatgat tccaccagtg 120

aagctgaaat ggcttgaaca cttgaacagc tcctggatta cagaggacag tgaatctatt 180

gctacaagag agggagttgc tgttctgtat tctaaactgg ttagcaataa ggaagtagta 240

cctttgcccc aacaagtttt atgcctcaaa ggaccacagt tgccagactt tgaacgtgag 300

tctctttcaa gtgatgagca ggaccactat ttggatgccc ttcttagcag ccagctagca 360

ttggcaaaga tggtatgttc agattcccca tttgccgggg cacttagaaa acgactgctt 420

gtactccagc gtgtctttta tgcactttct aataaatacc atgacaaagg caaggtgaag 480

cagcagcagc attctccgga gagcagttct ggttcagcag atgtccattc tgttagtgaa 540

cgccccggt caagcactga tgcacttata gaaatgggtg ttcgaactgg tctaagttta 600

ttatttgcgc ttctaagaca aagttggatg atgcctgtgt caggacctgg tctcagtctt 660

tgcaacgatg tcattcatac tgcaattgaa gttgtgagct ctttgccacc attatcatta 720

gcaaatgaaa gcaagattcc tcctatgggc ttggactgct tatcgcaagt aacaacattt 780

cttaaaggag tcactattcc taattctggg gcagacactt taggtcgtag attagcttct 840

gagttgctgc ttggtttggc agctcaacga ggctcattgc gatatcttct tgaatggata 900

gaaatggctt tgggggcttc ggcagttgta cacaccatgg agaaaggcaa actactctca 960

agccaggaag gaatgatcag ctttgactgc tttatgacca tattaatgca gatgaggcgt 1020

tctttgggtt catctgctga tcggagtcag tggagagaac caaccagaac atcggatggc 1080

ttgtgctccc tttacgaggc agcattatgt ctctttgaag aggtttgcag aatggcttct 1140

gattattcga gaacatgtgc tagcccagat agcattcaga ctggtgatgc tcccattgtc 1200

tccgaaacct gtgaggttta tgtttggggg agcaatagca gccatcagtt ggtagaaggt 1260

acacaggaga aaatactgca acccaaactg gctcctagtt tctctgatgc acagaccatt 1320

gaagctggac agtactgcac ttttgtcatt tctacggatg gctcagttag agcttgcggg 1380

aaaggcagct atgggagact gggccttgga gactccaata atcagtcaac tttaaaaaag 1440

ttaacattcg agcctcacag atccattaaa aaggtttcat cttctaaagg atctgatggt 1500

cacactttag cctttacgac agaaggagaa gtcttcagtt ggggagatgg tgattatggg 1560

aaactggggc atggaaatag ttcaacacag aaatatccca agcttattca gggacctcta 1620

caaggaaagg tagttgtttg tgtgtcagct ggatacagac atagtgctgc tgtcacagag 1680

gatggggaat tatacacatg gggtgaagga gactttggaa gattaggtca tggtgacagc 1740

aatagtcgta acattccaac attagtaaaa gacatcagca atgtaggaga ggtttcttgt 1800

ggcagttcac atactattgc tctgtctaaa gatgggagaa ctgtatggtc ttttggagga 1860

ggagacaatg gtaaacttgg tcatggtgat accaacagag tgtataaacc taaagttatt 1920

gaagctttac aaggaatgtt cattcgcaaa gtttgtgctg ggagccagtc ttcacttgct 1980

ttgacatcaa cagggcaggt ctatgcttgg ggctgtggag cttgtctagg ttgtggttct 2040

tcagaagcta ctgctttgag acccaagctt attgaagaac tggctgccac aagaatagtt 2100

gatgtttcta ttggagacag tcattgtttg gctctttctc atgataatga agtttatgcc 2160

tggggcaata actcaatggg gcaatgtggt cagggaaatt ccacaggtcc tattactaaa 2220

ccaaagaaag tgagtggctt agatggcata gctattcagc agatttcggc tggaacatca 2280

catagtctgg catggactgc tcttcctagg gacagacaag ttgttgcatg gcaccgacct 2340

tattgtgtag atcttgaaga gagtaccttc tcacacctgc gttcttttct tgagagatac 2400

tgtgataaaa taaacagtga gattccccca ctccctttcc cttcatcaag agaacaccac 2460

agttttctca agctgtgcct gaagctactt tcaaatcacc ttgctcttgc acttgcggga 2520

ggggtagcta ccagcattct cgggaggcag gcaggtccac ttcgaaattt gctcttcaga 2580

ctgatggact caactgtccc agatgaaatc caagaggtgg taattgaaac tttatcagtg 2640

ggagcaacca tgctgttacc tccattacga gaacggatgg aattacttca ttctctttta 2700

cctcaaggac ctgatagatg ggaaagctta tctaaaggac agagaatgca actggatatc 2760

atcctgacaa gtttgcaaga tcatacccac gtagcctccc tacttggcta tagttcaccc 2820

tctgatgctg ctgacctatc ttctgtgtgt actggctacg gaaatctgtc agatcaacct 2880

tacggcactc agagctgcca tccagatacc cacctggctg aaattttgat gaagaccctc 2940

ttaagaaatt taggatttta tacagatcaa gcatttggag agctagaaaa gaatagtgat 3000

aaatttctac ttggaacatc atcatcagaa aacagtcagc ctgctcatct tcatgaactg 3060

ctatgttcac tacagaaaca gctgctggca ttttgccata tcaataacat tagtgagaac 3120

tcaagcagtg tggcattgct tcataaacat cttcagcttt tgttgcctca tgccacagat 3180

atttattcac gttctgcaaa tttgctcaaa gaaagtcctt ggaatggcag tgttggagaa 3240

aaattaagag atgtgatata cgtctcagct gctggcagta tgctctgcca gattgttaac 3300

tccctgctgt tactccctgt gtcagtggct cggcctttat tgagttacct cctcgacttg 3360

ttgccacctc ttgattgcct taatagactc ctgccagctg ctgatctttt agaagaccag 3420

gagttacagt ggcctcttca tggagggcca gaactaattg atcctgctgg tctgccatta 3480

cctcagccag ctcagtcctg ggtatggctt gtggatctag aaagaacaat tgctctcctt 3540

attgggcggt gtcttggtgg catgcttcag ggctcccctg tgtctccaga ggaacaggac 3600

actgcatatt ggatgaaaac gccactgttc agtgacggtg tagaaatgga cactcctcaa 3660

ttggataaat gtatgagttg cctgttagaa gtagcacttt ctggaaatga agaacagaag 3720

ccttttgatt ataaattgcg gcctgaaatt gctgtctatg tagacttggc attgggttgt 3780

tctaaagagc ctgcccgaag cctttggatc agcatgcagg actatgctgt tagtaaagat 3840

tgggacagtg caactttaag taatgagtca ctcttggaca ctgtgtctag atttgttctt 3900

gcagctcttc tgaaacacac aaatttactt agtcaagcat gtggagaaag ccgatatcaa 3960

cctggtaaac acttatcaga agtgtaccgt tgtgtataca aagttcgaag tcgtttactt 4020

gcttgcaaga accttgaact tattcaaaca aggtcatcat cacgggacag atggatatca 4080

gaaaaccagg actctgcaga tgttgatcct caggagcatt catttactcg aactattgat 4140

gaagaagctg aaatggaaga acaggctgag agagaccggg aagaggggca tccggagcca 4200

gaggatgaag aggaggaacg ggaacatgaa gtgatgacag ctggcaaaat ctttcagtgt 4260

ttcctctcag cccgtgaagt agctcgtagc cgagaccgag atagaatgaa cagtggggca 4320

gggtctgggg ctcgagctga tgatccacct cctcagtctc agcaagagcg aagggtcagc 4380

acagaccttc ctgagggtca ggatgtgtac actgctgcat gcaactccgt gatccatcgg 4440

tgtgccctgt taatattagg agtaagtcct gtgatagatg agcttcagaa gcgaagagaa 4500

gaaggacagt tgcagcaacc ttcaacaagt gcctctgaag ggggtggact tatgaccagg 4560

agtgaaagtc ttactgcaga gagccggcta gtccacacaa gcccaaatta tagactgatc 4620

aaatcgagga gtgaatctga tttgtctcag cctgaatcag atgaagaggg ttacgcactg 4680

agtggcagac aaaatgttga tttggatttg gcagcatctc acagaaagag aggtcctatg 4740

cacagtcaat tggaatccct gagtgactct tgggctcgcc tgaaacatag cagagactgg 4800

ttatgcaact cctcctattc ctttgagtca gattttgatc ttaccaagtc tttgggagtt 4860

cacactttga ttgaaaatgt tgtaagcttt gtgagtggag atgtggggaa tgccccaggt 4920

tttaaagagc cagaggaaag tatgtctaca agtccccagg cctccatcat tgcaatggaa 4980

cagcagcagt taagggcaga acttcgttta gaggcacttc atcagatcct cgttctattg 5040

tctgggatgg aagaaaaagg tagcatctca ctggcaggaa gcagattgag ttcaggcttc 5100

cagtcctcca cactactcac gtctgtgagg ctgcagttcc tagcagggtg ttttggttta 5160

ggcactgttg gacacacagg agccaaggga gagagtggcc gattgcatca ctatcaggat 5220

gggatcagag cagctaagag aaatattcag attgaaatcc aggtagctgt gcataaaatt 5280

tatcaacagt tgtctgctac cctggaaaga gccctgcaag caaacaagca tcacattgaa 5340

gcccagcaac gtctgcttct ggttacagtt tttgccctaa gtgttcatta tcaaccagta 5400

gatgtttctt tggcaatttc cactggtctg ctaaacgtat tgtcacagtt gtgtggtaca 5460

gacaccatgc taggacagcc cctgcagttg ttgccaaaga cgggtgtttc ccagcttagc 5520

acagctttga aagtggccag tacaaggttg ctccagattc tagccatcac tactgggacc 5580

tatgctgata aactgagtcc caaagtagtt caatccttgt tggatctact ctgtagtcag 5640

ttgaagaatt tattgtccca aactggtgta ctacatatgg cctctttcgg agaaggggag 5700

caagaagacg gtgaagaaga agaaaaaaaa gttgactcca gtggagaaac tgagaagaaa 5760

gatttcagag ctgctcttag gaaacaacat gcagccgaac tccatctagg ggatttttta 5820

gtttttcttc gcagagttgt atcttcaaaa gcaattcaat caaaaatggc ttccccaaag 5880

tggaccgaag tgcttctaaa tatagcatct cagaaatgtt cttcaggtat ccctctggtt 5940

ggtaacttaa gaacaaggct ccttgcactt catgtccttg aagctgtgct gccagcttgt 6000

gaatctggtg tagaagatga tcaaatggcc cagattgttg agcgcttatt ttcccttctc 6060

tctgattgta tgtgggagac acccattgct caggccaaac atgctattca gataaaggaa 6120

aaagaacaag aaataaaact acagaagcag ggcgagttgg aagaagaaga tgagaatctt 6180

cctatccaag aagtatcctt tgacccggag aaagctcagt gttgcctagt ggagaatgga 6240

cagattttaa ctcacggcag tggagggaaa ggatatggat tggcatctac aggagtaact 6300

tctgggtgct atcagtggaa gttttatatt gtgaaggaaa acagaggtaa tgaaggcacg 6360

tgtgttggag tttctcgctg gccagtacat gactttaatc accgcactac ctcggatatg 6420

tggctctata gggcctacag tggtaacctc tatcacaatg gagaacagac tctcacattg 6480

tccagcttta ctcaaggaga tttcattacc tgtgtgttag acatggaagc caggaccatt 6540

tcttttggga aaaatggaga ggaacccaaa ttagcttttg aagatgtgga tgcagcagag 6600

ttgtacccat gtgtgatgtt ctatagtagc aatccagggg aaaaggtgaa aatttgtgat 6660

atgcagatgc gtggcacacc ccgagactta cttccaggag accctatttg tagtccagta 6720

gcagcagtgc tggctgaggc cactattcag ctcgtccgta tccttcaccg aacagaccgt 6780

tggacttact gcattaacaa aaaaatgatg gaaaggcttc acaaaattaa gatatgtatt 6840

aaagagtcag gtcagaagct aaagaaaagc cgctcggttc agagccgaga ggaaaatgaa 6900

atgagagagg agaaggagag caaagaggaa gagaaaggta aacatactag gcatggcctc 6960

gctgacctct cagagctgca gctgaggact ctttgcatag aggtgtggcc cgtgctggct 7020

gtgataggag gagttgatgc tggtcttaga gttggaggtc ggtgtgttca caagcaaact 7080

gggcgccatg ccacgctgct gggagtggtc aaagagggca gcacgtctgc caaggtccaa 7140

tgggatgaag cagaaattac tatcagcttc ccaacttttt ggtcgcctag tgatactcca 7200

ttgtataatc tggaaccctg tgaaccattg ccgtttgatg tggcgcgatt ccgaggcctg 7260

acggcttctg tgctgctgga cctaacatat ctcactggcg ttcatgaaga catgggcaaa 7320

cagagcacca aacgacatga aaagaaacac cgacatgaat ccgaggagaa aggggatgtt 7380

gagcagaaac ctgagagtga atccgcttta gatatgcgaa caggcctaac atctgatgac 7440

gtcaaaagtc agagtaccac aagctccaaa tcagaaaatg aaatcgcttc attttcttta 7500

gatccaacac tgccaagtgt ggaatcccaa catcaaataa cagaagggaa aagaaaaaat 7560

catgaacaca tgtccaaaaa ccatgatgta gcccagtcag aaatcagagc agtccagctg 7620

tcctatcttt acctcggtgc tatgaagtca cttagtgccc ttcttggctg tagtaaatat 7680

gctgagctgt tgctgatacc aaaagttctg gctgaaaatg gccacaactc agactgtgca 7740

agttctccag ttgttcatga agacgtggag atgcgagcag ccctgcagtt cttgatgcga 7800

cacatggtga agcgagcagt catgcggtca cccataaaga gagcattggg attagctgat 7860

ctggaacgag cgcaagccat gatctataaa ttagtggttc atgggctttt ggaagaccag 7920

tttgggggca aaattaagca agagattgat caacaagctg aagaaagtga ccctgcccag 7980

caggcacaga caccagttac tactagccca tcagcctcaa gcacgacctc ctttatgagc 8040

agctctctgg aggacaccac aactgccacc actccagtca ctgacacaga aacagtgcct 8100

gcatccgagt ccccgggagt gatgcctctt agtcttctca ggcaaatgtt ctctagttac 8160

ccaactacca ctgtacttcc cacacgtcgg gcacagactc ctccaatatc ttcgttacca 8220

acctctcctt ctgatgaagt aggaaggagg caaagtttaa cttctcctga ttcccagtca 8280

gcaaggccag ctaaccgcac agccttgtca gacccaagca gtagactttc aacttctcct 8340

cctcctccag caattgcagt tcccttgctg gaaatggggt tctctcttcg gcagattgcc 8400

aaagccatgg aagctacagg tgctagggga gaggctgatg cccagaatat cactgtcctt 8460

gccatgtgga tgatagagca ccctgggcat gaggatgaag aggagcccca gtcgggcagc 8520

acagcagact ctaggcctgg agcagccgtt ctaggcagtg gcgggaagtc aaatgatccc 8580

tgttatttgc agtcacctgg agacatacca tcagctgatg ctgctgaaat ggaggaaggt 8640

tttagtgaaa gccctgataa tttggatcat acagagaatg cagcttctgg aagtggacca 8700

tcagctagag gtcgctcagc ggtaacaaga agacacaagt ttgacttagc tgctcgcaca 8760

ctgctagcaa gagcagcggg attataccgc tctgtgcagg cccacaggaa tcaaagtcgg 8820

agagaaggaa tatctttgca gcaagaccca ggggcgttgt atgactttaa tttagatgag 8880

gaattggaaa ttgatcttga tgatgaggcg atggaagcta tgtttggaca agacctgacc 8940

agtgacaatg atattctggg aatgtggatc ccagaggtac tggattggcc tacctggcat 9000

gtttgtgagt ctgaagacag ggaagaagtg gtggtgtgtg aactgtgtga atgcagcgtc 9060

gtcagcttca atcagcacat gaagagaaac catccaggct gtgggcgcag tgcaaaccgc 9120

cagggctatc gcagcaatgg ttcctatgtg gatggctggt ttggcggtga atgtgggagt 9180

ggaaatccat actacctgtt atgtggcacc tgcagggaga agtacttagc catgaagacc 9240

aaatctaagt caacaagttc tgaaaggtac aagggacaag ctccagatct aattggcaag 9300

caagacagtg tgtatgaaga agactgggac atgttggatg ttgatgaaga tgaaaagcta 9360

actggtgaag aagaatttga attacttgct ggaccgcttg gtttaaatga ccggcgcatt 9420

gtaccagaac cagttcagtt ccctgacagc gatccactgg gagcatcagt agcaatggtc 9480

acagccacca acagtatgga agagactctg atgcaaatag gttgccatgg ctccgtagaa 9540

aagagctcct ctgggagaat aacgttagga gagcaggcag ctgccctagc aaaccctcat 9600

gaccgtgtgg tggctttaag gagagtgact gctgctgctc aggttcttct ggccagaacc 9660

atggtcatga gagcgctgtc tcttctctca gtcagtggtt ccagttgtag cctggctgct 9720

ggtcttgagt ctctggggct aacagatatc cgaacgctag ttcgattaat gtgcttggca 9780

gcagcaggga gagctggcct ctccaccagc ccttctgcca tggctagcac ctcagaacga 9840

tcacgaggtg ggcatagcaa ggctaacaag cctatctctt gcctggccta tttgagcaca 9900

gcagtgggat gtctggcatc aaatgctcct agtgctgcca aactgcttgt acagttgtgt 9960

acacagaact tgatttctgc tgcaacaggt gtaaatctaa ccacagttga tgactcaatt 10020

cagcgaaagt ttctacccag ctttctccga ggaattgctg aagagaacaa gcttgtgacc 10080

tccccaaact ttgttgtaac acaggccctt gtggcattgc tagcagacaa aggggccaaa 10140

ctaagaccta actatgataa gtcagaagtt gaaaagaaag gccctctgga gttggctaat 10200

gccctggcag cctgctgcct ctcctccagg ctgtcctcac agcatcggca atgggcagct 10260

cagcaactcg tgcgcactct tgctgcacac gaccgtgaca accaaactac tctgcagaca 10320

cttgctgata tgggaggaga tcttagaaaa tgctccttta tcaaattgga ggctcatcag 10380

aacagagtaa tgacatgtgt ttggtgtaat aaaaaaggtc ttttggctac aagtggcaat 10440

gatggcacca tccgcgtatg gaatgttacc aagaagcaat attcactgca acagacctgt 10500

gtgttcaaca gattggaagg ggatgctgag gaaagcctgg gatcacccag tgatccaagt 10560

ttctcaccag tttcctggag tatcagtggc aaatatctag caggcgcttt ggaaaagatg 10620

gtgaatatct ggcaagttaa tggaggaaaa ggattagtag atattcagcc tcattgggta 10680

tctgccctgg cttggccaga agagggtccg gctacagcct ggtcaggaga gtctccagaa 10740

ttgttgttgg tgggacggat ggatggatct ctgggactga ttgaagttgt tgatgtgtcc 10800

accatgcacc gtcgagaatt ggagcattgc tatcgaaagg atgtgtctgt tacttgcatt 10860

gcatggttca gtgaagacag accatttgca gtgggatatt ttgatggaaa actgttactg 10920

ggaacaaagg aaccacttga gaaaggaggc attgttctaa ttgatgcaca taaggatact 10980

cttattagca tgaagtggga ccctacaggt catattctta tgacatgtgc caaagaagac 11040

agtgtgaaac tctggggctc tatttcggga tgctggtgct gtctacattc actctgccat 11100

ccatctattg taaatggcat tgcttggtgc cgccttccag ggaaaggatc caagttgcag 11160

ttactgatgg ctactggctg tcagagtggc ttagtatgtg tttggcgcat tcctcaagat 11220

actacacaga ccaatgtgac tagtgcagaa ggatggtggg accaggaatc aaattgccag 11280

gatggatata ggaaatcatc aggagccaag tgtgtttatc agctgcgggg acacatcact 11340

cctgttcgga ctgttgcctt tagttctgat gggttggccc tggtgtctgg tggactaggt 11400

gggctcatga acatttggtc tttaagggat ggctctgtct tgcaaactgt tgtgataggc 11460

tctggagcta ttcagaccac agtatggatt ccagaagttg gagtagctgc ttgctcaaat 11520

agatcaaagg atgttttggt cgtgaattgt acagcagaat gggcagctgc caatcatgtt 11580

ttggcaacct gtaggacagc attgaaacag cagggtgttc tgggattgaa catggctccc 11640

tgcatgagag cattttgga gcggctcccc atgatgcttc aggagcagta tgcctatgaa 11700

aagcctcatg tggtttgtgg tgaccaactt gttcatagcc cctatatgca atgcttggct 11760

tcccttgctg tgggacttca tctggatcag ctgttgtgta accctccagt gccaccacac 11820

caccagaact gtctgcctga ccctgcatcc tggaatccaa atgaatgggc ctggttagaa 11880

tgtttctcaa ccactataaa agctgccgaa gccctgacca atggagccca gtttccagaa 11940

tcttttaccg ttccagatct agaacctgtt ccagaggatg aacttgtatt tctaatggat 12000

aacagtaaat ggattaacgg catggatgaa caaattatgt cttgggcaac ttccagacct 12060

gaggactggc acctgggagg taaatgtgat gtctacttat ggggtgctgg taggcatgga 12120

cagctggcag aagctggaag aaatgtaatg gtacctgcag cagctccctc attctcacag 12180

gcccaacagg tcatttgtgg tcagaattgt acctttgtca tccaggccaa tggcacagtg 12240

ttggcttgtg gggaaggaag ttatggcaga ttaggacaag gaaattcaga tgaccttcat 12300

gtgctgacag ttatttcagc cttacaaggc tttgtggtga cccagctggt gacttcctgt 12360

ggttctgatg ggcactctat ggccctaact gaaagtggtg aggtctttag ctggggagat 12420

ggtgactatg gtaaacttgg ccatgggaac agcgacaggc agcggcggcc caggcagatc 12480

gaggccttac aaggagaaga agtggtgcag atgtcttgtg gcttcaagca ctcagcagtg 12540

gtcacttcag atggcaaact gttcaccttt gggaatggtg actatggtcg tctgggtctt 12600

ggaaatacct ctaacaaaaa acttccagag agagtgactg cactggaggg atatcagatt 12660

ggacaggtgg cctgtggatt aaaccacact ttggcagtgt cagcagatgg ttccatggtg 12720

tgggcttttg gagatggaga ctatggaaaa ctaggcttag gaaattccac tgcaaaatct 12780

tcacctcaga aaattgacgt cctttgtgga attggaataa aaaaggttgc ttgtggaact 12840

cagttttctg ttgctttgac caaagatggt catgtgtata cctttggtca agatcgcctg 12900

ataggcttgc cagaggggcg tgctcgcaat cacaatcgac cgcaacaaat ccctgtcctg 12960

gctggagtaa tcattgaaga tgtggcagtt ggagctgaac acacacttgc tttggcatca 13020

aatggagatg tgtatgcctg ggggagcaat tcagaagggc agctcggctt aggccatacc 13080

aaccatgttc gagaaccaac cctggtaaca ggtctgcaag ggaaaaatgt tcggcagatc 13140

tcggctggcc gctgccacag tgctgcatgg acagcaccac ctgtcccacc aagagcacca 13200

ggtgtgtcag tacctctgca gctgggcctg cctgacacag tgcccccca gtatggggcg 13260

ctgagagaag tcagcattca cacggtgcgg gccaggctcc ggctgctcta ccacttctct 13320

gacctcatgt actcatcctg gagactgctg aaccttagcc ccaacaacca gaacagcaca 13380

tcccattata atgctggaac ttggggcatt gtacagggac aacttcggcc tttgttagcc 13440

ccaagagtct acactctgcc aatggtgcgc tccataggaa aaaccatggt tcaaggcaaa 13500

aactatggac ctcagataac tgtaaagagg atatcaacca gaggacggaa gtgtaagcct 13560

atttttgtcc aaatagcgag acaagtagtt aagctgaatg cttcagacct ccgcctgcct 13620

tcccgagcgt ggaaggttaa gctggttgga gaaggggctg atgatgctgg aggagtgttt 13680

gatgacacca tcacagagat gtgccaggaa cttgaaactg gtattgttga ccttcttata 13740

ccctctccca atgccaccgc agaagtgggt tacaataggg acaggttcct ttttaaccct 13800

tctgcctgcc tcgatgaaca cttaatgcag tttaagtttt taggaatttt aatgggggtt 13860

gccattcgca caaagaagcc tctggacctc cacttggccc ctctggtgtg gaagcagctg 13920

tgctgtgtcc cactcaccct agaggacctg gaggaggtgg atctgctcta cgtgcagact 13980

ctcaacagca ttcttcacat tgaagacagt gggattaccg aggagagttt ccatgagatg 14040

attcctcttg attcttttgt tggccagagt gctgatggca aaatggttcc tataatccct 14100

ggtggaaata gtatcccact cacattttcc aacaggaagg aatatgtgga gagggccatt 14160

gaatatcgac ttcatgagat ggacagacag gtggctgcag tccgagaagg gatgtcctgg 14220

attgttcctg tgccgctgct gtccctcctc acagcaaaac aactggagca gatggtgtgt 14280

gggatgcccg agatctctgt ggaagtcttg aagaaagtgg tgcggtaccg tgaggtggat 14340

gagcagcatc agctggtgca gtggttctgg cacacgctgg aagagttctc caatgaggag 14400

cgggtgcttt tcatgaggtt tgtgtcagga agatctcgac taccagccaa cactgctgac 14460

atttctcaga gatttcaaat catgaaggtt gataggcctt acgacagtct gcctacctca 14520

cagacctgct tcttccagct gaggctgccc ccgtactcca gccagctggt catggccgag 14580

cgcctgcgct atgccatcaa caactgccgc tcaatcgaca tggacaacta catgctctcg 14640

agaaacgtgg acaacgccga gggctccgac actgactact gaccgtgcgg gtgctctcac 14700

cctcccttct ctccctcaat aatgctcact tctgatttga tgttgatata cttttatggt 14760

aactacatag atgttataag aacataaacc aacattataa acaatggcca catttagtta 14820

ctctaaatgt aacaaagaaa ttagatgttt ttatttttct gtgattgtac aaaaacaaca 14880

aaaacgaagt gctctcagtc aggtttttcc ctccatattt ttggtcactt ttgataagtt 14940

tgcatgaaac cattttggtg catttttagt tgggaatggt acatttttgt aaatccaccc 15000

agtgaacatg aaattgtaca ttgtgtataa ttgttcatta gaaaggacag ttttacatga 15060

atattcatat atttattttg ttttaatttg aattgcctgt tcagggttcc ttatgcagag 15120

aaataaagca gattcaggaa ttggaaaaaa aaaaaaaaaa aaaa 15164

<210> 21
<211> 1201
<212> DNA
<213> Homo sapiens

<400> 21
cctagttaaa acagcagccc atcaaagtct ttaaccctct tagcatttac tcagattact 60

ttttcattta gcatttatca ccatatattt acttattttt ctctctcctc ctgtactcct 120

tgaaatatga gctgcacaaa ggacaagatt attattttgt tctattctaa gcatctagtg 180

tactttctgg cagactgcaa atgaaagaaa gaataaatga aagcatgact tgtgttttat 240

tgcacaggaa gcagtggctg ggacaagctg tggaaaaagt acggatcacg ctttccccag 300

gatgacctct gccagtatat cacatcagat gacctcactc agatgctgga caacctaggg 360

cttaagtatg agtgctatga ccttttgtcc accatggata tatctgactg ctttattgat 420

ggtaatgaaa atggagacct gctttgggat tttttgactg aaacctgcaa ctttaatgcc 480

acagcaccac ctgatctcag agcagagctt gggaaagatc tacaagagcc tgaatttagt 540

gctaagaaag aggggaaggt tctttttaat aatactctga gtttcatagt gattgaggca 600

taactatcaa tcacaaaagt atattcaaaa attatatttt gaacaactcg aatcactcat 660

ttgtttccat attaaaatca caaactcatc cattaatgta gataaagcac tgtttggata 720

tgagatgtag caaattccaa tacattattg gacttccatt tggaatcata tgggatactg 780

ctggtcttat cctgtccctc ctccaggtag agagaccaca tgcaggctca acataacata 840

agctagaaaa attagatgac tgaatttcta tggcatattg ataataaaat tcattccatt 900

tgctgattgt ctgaaatttt ctagaatact aataaaatac atactataga ttcttttatta 960

gtgaagtatg cactaatcaa tactttgaac acaaagcctg tgttactgat ttggccgttt 1020

tgtgaagaaa catttatctt tgtacgttct tctattgtgc tttctatcta atttttatta 1080

atttgtaaga gtaagcacct ttagaatatt aaaaattaat tctttatcac atgttgtcat 1140

ttcttcccat tgtgttttct cttgtaattt tatctgtgaa ttaatagctt ggggttggtc 1200

t 1201

<210> 22
<211> 1790
<212> DNA
<213> Homo sapiens

<400> 22
tactaaccat gctgaccact gttcggaacg ggattgaatc acagaaaaac agcaaatggc 60

tctctcttac agagtgtctg aacttcaaag cacaattcct gagcacattt tgcagagcac 120

ctttgttcac gttatctctt ctaactggtc tggattacag acagaatcaa taccagagga 180

aatgaaacag attgttgagg aacagggaaa taaactgcac tgggcagctc ttctgatact 240

catggtgata atacccacaa ttggtggaaa tacccttgtt attctggctg tttcactgga 300

gaagaagctg cagtatgcta ctaattactt tctaatgtcc ttggcggtgg ctgatttgct 360

ggttggattg tttgtgatgc caattgccct cttgacaata atgtttgagg ctatgtggcc 420

cctcccactt gttctatgtc ctgcctggtt atttcttgac gttctctttt caaccgcatc 480

catcatgcat ctctgtgcca tttcagtgga tcgttacata gccatcaaaa agccaatcca 540

ggccaatcaa tataactcac gggctacagc attcatcaag attacagtgg tgtggttaat 600

ttcaataggc attgccattc cagtccctat taaagggata gagactgatg tggacaaccc 660

aaacaatatc acttgtgtgc tgacaaagga acgttttggc gatttcatgc tctttggctc 720

actggctgcc ttcttcacac ctcttgcaat tatgattgtc acctactttc tcactatcca 780

tgctttacag aagaaggctt acttagtcaa aaacaagcca cctcaacgcc taacatggtt 840

gactgtgtct acagttttcc aaagggatga aacaccttgc tcgtcaccgg aaaaggtggc 900

aatgctggat ggttctcgaa aggacaaggc tctgcccaac tcaggtgatg aaacacttat 960

gcgaagaaca tccacaattg ggaaaaagtc agtgcagacc atttccaacg aacagagagc 1020

ctcaaaggtc ctagggattg tgtttttcct ctttttgctt atgtggtgtc ccttctttat 1080

tacaaatata actttagttt tatgtgattc ctgtaaccaa actactctcc aaatgctcct 1140

ggagatattt gtgtggatag gctatgtttc ctcaggagtg aatcctttgg tctacaccct 1200

cttcaataag acatttcggg atgcatttgg ccgatatatc acctgcaatt accgggccac 1260

aaagtcagta aaaactctca gaaaacgctc cagtaagatc tacttccgga atccaatggc 1320

agagaactct aagtttttca agaaacatgg aattcgaaat gggattaacc ctgccatgta 1380

ccagagtcca atgaggctcc gaagttcaac cattcagtct tcatcaatca ttctactaga 1440

tacgcttctc ctcactgaaa atgaaggtga caaaactgaa gagcaagtta gttatgtata 1500

gcagaactgg cagttgtcat caaacataat gatgagtaag atgatgaatg agatgtaaat 1560

gtgcccagaa tatattatat aaagaatttt atgtcatata tcaaatcatc tctttaacct 1620

aagatgtaag tattaagaat atctaatttt cctaatttgg acaagattat tccatgagga 1680

aaataatttt atatagctac aaatgaaaac aatccagcac tctggttaaa ttttaaggta 1740

ttcgaatgaa ataaagtcaa atcaataaat ttcaggcttt aaaaaaaaaa 1790

<210> 23
<211> 985
<212> DNA
<213> Homo sapiens

<400> 23
acatcccaat ggccctgtcc ttttctttac tgatggccgt gctggtgctc agctacaaat 60

ccatctgttc tctgggctgt gatctgcctc agacccacag cctgggtaat aggagggcct 120

tgatactcct ggcacaaatg ggaagaatct ctcctttctc ctgcctgaag gacagacatg 180

actttggatt cccccaagag gagtttgatg gcaaccagtt ccagaaggct caagccatct 240

ctgtcctcca tgagatgatc cagcagacct tcaatctctt cagcacaaag gactcatctg 300

ctacttggga acagagcctc ctagaaaaat tttccactga acttaaccag cagctgaatg 360

acatggaagc ctgcgtgata caggaggttg gggtggaaga gactcccctg atgaatgtgg 420

actccatctt ggctgtgaag aaatacttcc aaagaatcac tctttatctg acagagaaga 480

aatacagccc ttgtgcttgg gaggttgtca gagcagaaat catgagatcc ttctctttat 540

caaaaatttt tcaagaaaga ttaaggagga aggaatgaaa ccgtttcaac atggaaatga 600

tctgtattga ctaatacacc agtccacact tctatgactt ctgccatttc aaagactcat 660

ttctcctata accaccgcat gagttgaatc aaaattttca gatcttttca ggagtgtaag 720

gaaacatcat gtttacctgt gcaggcacta gtcctttaca gatgaccatg ctgatagatc 780

taattatcta tctattgaaa tatttattta tttattagat ttaaattatt tttgtccatg 840

taatattatg tgtactttta cattgtgtta tatcaaaata tgttaatcta atatttagtc 900

aatatattat tttcttttta ttaattttta ctattaaaac ttcttatatt atttggttat 960

tctttaataa agaaattcca agccc 985

<210> 24
<211> 7260
<212> DNA
<213> Homo sapiens

<400> 24
tcactgtcac tgctaaattc agagcagatt agagcctgcg caatggaata aagtcctcaa 60

aattgaaatg tgacattgct ctcaacatct cccatctctc tggatttcct tttgcttcat 120

tattcctgct aaccaattca ttttcagact ttgtacttca gaagcaatgg gaaaaatcag 180

cagtcttcca acccaattat ttaagtgctg cttttgtgat ttcttgaagg tgaagatgca 240

caccatgtcc tcctcgcatc tcttctacct ggcgctgtgc ctgctcacct tcaccagctc 300

tgccacggct ggaccggaga cgctctgcgg ggctgagctg gtggatgctc ttcagttcgt 360

gtgtggagac aggggctttt atttcaacaa gcccacaggg tatggctcca gcagtcggag 420

ggcgcctcag acaggcatcg tggatgagtg ctgcttccgg agctgtgatc taaggaggct 480

ggagatgtat tgcgcacccc tcaagcctgc caagtcagct cgctctgtcc gtgcccagcg 540

ccacaccgac atgcccaaga cccagaagga agtacatttg aagaacgcaa gtagagggag 600

tgcaggaaac aagaactaca ggatgtagga agaccctcct gaggagtgaa gagtgacatg 660

ccaccgcagg atcctttgct ctgcacgagt tacctgttaa actttggaac acctaccaaa 720

aaataagttt gataacattt aaaagatggg cgtttccccc aatgaaatac acaagtaaac 780

attccaacat tgtctttagg agtgatttgc accttgcaaa aatggtcctg gagttggtag 840

attgctgttg atcttttatc aataatgttc tatagaaaag aaaaaaaaat atatatatat 900

atatatctta gtccctgcct ctcaagagcc acaaatgcat gggtgttgta tagatccagt 960

tgcactaaat tcctctctga atcttggctg ctggagccat tcattcagca accttgtcta 1020

agtggtttat gaattgtttc cttatttgca cttctttcta cacaactcgg gctgtttgtt 1080

ttacagtgtc tgataatctt gttagtctat acccaccacc tcccttcata acctttatat 1140

ttgccgaatt tggcctcctc aaaagcagca gcaagtcgtc aagaagcaca ccaattctaa 1200

cccacaagat tccatctgtg gcatttgtac caaatataag ttggatgcat tttatttttag 1260

acacaaagct ttatttttcc acatcatgct tacaaaaaag aataatgcaa atagttgcaa 1320

ctttgaggcc aatcattttt aggcatatgt tttaaacata gaaagtttct tcaactcaaa 1380

agagttcctt caaatgatga gttaatgtgc aacctaatta gtaactttcc tctttttatt 1440

ttttccatat agagcactat gtaaatttag catatcaatt atacaggata tatcaaacag 1500

tatgtaaaac tctgtttttt agtataatgg tgctattttg tagtttgtta tatgaaagag 1560

tctggccaaa acggtaatac gtgaaagcaa aacaataggg gaagcctgga gccaaagatg 1620

acacaagggg aagggtactg aaaacaccat ccatttggga aagaaggcaa agtcccccca 1680

gttatgcctt ccaagaggaa cttcagacac aaaagtccac tgatgcaaat tggactggcg 1740

agtccagaga ggaaactgtg gaatggaaaa agcagaaggc taggaatttt agcagtcctg 1800

gtttcttttt ctcatggaag aaatgaacat ctgccagctg tgtcatggac tcaccactgt 1860

gtgaccttgg gcaagtcact tcacctctct gtgcctcagt ttcctcatct gcaaaatggg 1920

ggcaatatgt catctaccta cctcaaaggg gtggtataag gtttaaaaag ataaagattc 1980

agatttttt accctgggtt gctgtaaggg tgcaacatca gggcgcttga gttgctgaga 2040

tgcaaggaat tctataaata acccattcat agcatagcta gagattggtg aattgaatgc 2100

tcctgacatc tcagttcttg tcagtgaagc tatccaaata actggccaac tagttgttaa 2160

aagctaacag ctcaatctct taaaacactt ttcaaaatat gtgggaagca tttgattttc 2220

aatttgattt tgaattctgc atttggtttt atgaatacaa agataagtga aaagagagaa 2280

aggaaaagaa aaaggagaaa aacaaagaga tttctaccag tgaaagggga attaattact 2340

ctttgttagc actcactgac tcttctatgc agttactaca tatctagtaa aaccttgttt 2400

aatactataa ataatattct attcattttg aaaaacacaa tgattccttc ttttctaggc 2460

aatataagga aagtgatcca aaatttgaaa tattaaaata atatctaata aaaagtcaca 2520

aagttatctt ctttaacaaa ctttactctt attcttagct gtatatacat ttttttaaaa 2580

agtttgttaa aatatgcttg actagagttt cagttgaaag gcaaaaactt ccatcacaac 2640

aagaaatttc ccatgcctgc tcagaagggt agcccctagc tctctgtgaa tgtgttttat 2700

ccattcaact gaaaattggt atcaagaaag tccactggtt agtgtactag tccatcatag 2760

cctagaaaat gatccctatc tgcagatcaa gattttctca ttagaacaat gaattatcca 2820

gcattcagat ctttctagtc accttagaac tttttggtta aaagtaccca ggcttgatta 2880

tttcatgcaa attctatatt ttacattctt ggaaagtcta tatgaaaaac aaaaataaca 2940

tcttcagttt ttctcccact gggtcacctc aaggatcaga ggccaggaaa aaaaaaaaag 3000

actccctgga tctctgaata tatgcaaaaa gaaggcccca tttagtggag ccagcaatcc 3060

tgttcagtca acaagtattt taactctcag tccaacatta tttgaattga gcacctcaag 3120

catgcttagc aatgttctaa tcactatgga cagatgtaaa agaaactata catcattttt 3180

gccctctgcc tgttttccag acatacaggt tctgtggaat aagatactgg actcctcttc 3240

ccaagatggc acttcttttt atttcttgtc cccagtgtgt acctttttaaa attattcccc 3300

ctcaacaaaa ctttataggc agtcttctgc agacttaaca tgttttctgt catagttaga 3360

tgtgataatt ctaagagtgt ctatgactta tttccttcac ttaattctat ccacagtcaa 3420

aaatccccca aggaggaaag ctgaaagatg caactgccaa tattatcttt cttaactttt 3480

tccaacacat aatcctctcc aactggatta taaataaatt gaaaataact cattatacca 3540

attcactatt ttatttttta atgaattaaa actagaaaac aaattgatgc aaaccctgga 3600

agtcagttga ttactatata ctacagcaga atgactcaga tttcatagaa aggagcaacc 3660

aaaatgtcac aaccaaaact ttacaagctt tgcttcagaa ttagattgct ttataattct 3720

tgaatgaggc aatttcaaga tatttgtaaa agaacagtaa acattggtaa gaatgagctt 3780

tcaactcata ggcttatttc caatttaatt gaccatactg gatacttagg tcaaatttct 3840

gttctctctt gcccaaataa tattaaagta ttatttgaac tttttaagat gaggcagttc 3900

ccctgaaaaa gttaatgcag ctctccatca gaatccactc ttctagggat atgaaaatct 3960

cttaacaccc accctacata cacagacaca cacacacaca cacacacaca cacacacaca 4020

cacacattca ccctaaggat ccaatggaat actgaaaaga aatcacttcc ttgaaaattt 4080

tattaaaaaa caaacaaaca aacaaaaagc ctgtccaccc ttgagaatcc ttcctctcct 4140

tggaacgtca atgtttgtgt agatgaaacc atctcatgct ctgtggctcc agggtttctg 4200

ttactatttt atgcacttgg gagaaggctt agaataaaag atgtagcaca ttttgctttc 4260

ccatttattg tttggccagc tatgccaatg tggtgctatt gtttctttaa gaaagtactt 4320

gactaaaaaa aaaagaaaaa aagaaaaaaa agaaagcata gacatatttt tttaaagtat 4380

aaaaacaaca attctataga tagatggctt aataaaatag cattaggtct atctagccac 4440

caccaccttt caacttttta tcactcacaa gtagtgtact gttcaccaaa ttgtgaattt 4500

gggggtgcag gggcaggagt tggaaatttt ttaaagttag aaggctccat tgttttgttg 4560

gctctcaaac ttagcaaaat tagcaatata ttatccaatc ttctgaactt gatcaagagc 4620

atggagaata aacgcgggaa aaaagatctt ataggcaaat agaagaattt aaaagataag 4680

taagttcctt attgattttt gtgcactctg ctctaaaaca gatattcagc aagtggagaa 4740

aataagaaca aagagaaaaa atacatagat ttacctgcaa aaaatagctt ctgccaaatc 4800

ccccttgggt attctttggc atttactggt ttatagaaga cattctccct tcacccagac 4860

atctcaaaga gcagtagctc tcatgaaaag caatcactga tctcatttgg gaaatgttgg 4920

aaagtatttc cttatgagat gggggttatc tactgataaa gaaagaattt atgagaaatt 4980

gttgaaagag atggctaaca atctgtgaag atttttttgtt tcttggtttt gttttttttt 5040

ttttttttac tttatacagt ctttatgaat ttcttaatgt tcaaaatgac ttggttcttt 5100

tcttcttttt tttatatcag aatgaggaat aataagttaa acccacatag actctttaaa 5160

actataggct agatagaaat gtatgtttga cttgttgaag ctataatcag actatttaaa 5220

atgttttgct atttttaatc ttaaaagatt gtgctaattt attagagcag aacctgtttg 5280

gctctcctca gaagaaagaa tctttccatt caaatcacat ggctttccac caatattttc 5340

aaaagataaa tctgatttat gcaatggcat catttatttt aaaacagaag aattgtgaaa 5400

gtttatgccc ctcccttgca aagaccataa agtccagatc tggtaggggg gcaacaacaa 5460

aaggaaaatg ttgttgattc ttggttttgg attttgtttt gttttcaatg ctagtgttta 5520

atcctgtagt acatatttgc ttattgctat tttaatattt tataagacct tcctgttagg 5580

tattagaaag tgatacatag atatcttttt tgtgtaattt ctatttaaaa aagagagaag 5640

actgtcagaa gctttaagtg catatggtac aggataaaga tatcaattta aataaccaat 5700

tcctatctgg aacaatgctt ttgtttttta aagaaacctc tcacagataa gacagaggcc 5760

caggggattt ttgaagctgt ctttattctg cccccatccc aacccagccc ttattatttt 5820

agtatctgcc tcagaatttt atagagggct gaccaagctg aaactctaga attaaaggaa 5880

cctcactgaa aacatatatt tcacgtgttc cctctctttt ttttcctttt tgtgagatgg 5940

ggtctcgcac tgtcccccag gctggagtgc agtggcatga tctcggctca ctgcaacctc 6000

cacctcctgg gtttaagcga ttctcctgcc tcagcctcct gagtagctgg gattacaggc 6060

acccaccact atgcccggct aatttttttgg atttttaata gagacggggt tttaccatgt 6120

tggccaggtt ggactcaaac tcctgacctt gtgatttgcc cgcctcagcc tcccaaattg 6180

ctgggattac aggcatgagc caccacaccc tgcccatgtg ttccctctta atgtatgatt 6240

acatggatct taaacatgat ccttctctcc tcattcttca actatctttg atggggtctt 6300

tcaaggggaa aaaaatccaa gctttttttaa agtaaaaaaa aaaaaagaga ggacacaaaa 6360

ccaaatgtta ctgctcaact gaaatatgag ttaagatgga gacagagttt ctcctaataa 6420

ccggagctga attacctttc actttcaaaa acatgacctt ccacaatcct tagaatctgc 6480

ctttttttat attactgagg cctaaaagta aacattactc attttatttt gcccaaaatg 6540

cactgatgta aagtaggaaa aataaaaaca gagctctaaa atccctttca agccacccat 6600

tgaccccact caccaactca tagcaaagtc acttctgtta atcccttaat ctgattttgt 6660

ttggatattt atcttgtacc cgctgctaaa cacactgcag gagggactct gaaacctcaa 6720

gctgtctact tacatctttt atctgtgtct gtgtatcatg aaaatgtcta ttcaaaatat 6780

caaaaccttt caaatatcac gcagcttata ttcagtttac ataaaggccc caaataccat 6840

gtcagatctt tttggtaaaa gagttaatga actatgagaa ttgggattac atcatgtatt 6900

ttgcctcatg tatttttatc acacttatag gccaagtgtg ataaataaac ttacagacac 6960

tgaattaatt tcccctgcta ctttgaaacc agaaaataat gactggccat tcgttacatc 7020

tgtcttagtt gaaaagcata ttttttatta aattaattct gattgtattt gaaattatta 7080

ttcaattcac ttatggcaga ggaatatcaa tcctaatgac ttctaaaaat gtaactaatt 7140

gaatcattat cttacattta ctgtttaata agcatatttt gaaaatgtat ggctagagtg 7200

tcataataaa atggtatatc tttctttagt aattacaaaa aaaaaaaaaa aaaaaaaaaa 7260

<210> 25
<211> 2212
<212> DNA
<213> Homo sapiens

<220>
<221> Unsure

<222> (625)..(625)
<223> n = a, c, g or t/u

<400> 25
gcatatcctg gaggtgaagg taccacctca tggagacccc cgcggccgcc gcccccgctg 60

ggagcttatt cccctccttc ctgctcctgg cctgcgggac gctggtggcc gccttgctgg 120

gcgccgctca ccgcctgggg ctcttctatc agctgctgca caaggtggac aaggcaagcg 180

tccggcatgg cggagagaac gtggccgctg tgctgagggc ccatggtgtg cggttcatct 240

tcacgctggt cggtgggcac atttccccgc tgctggtggc ctgtgagaaa ctgggcatcc 300

gtgtggtgga cacacgccat gaggtcacgg ccgtctttgc tgctgatgct atggcccgcc 360

tgtccgggac ggtgggcgtg gcggcagtga cagcaggccc tggcctcacc aacacggtga 420

ctgcggtgaa gaatgctcag atggctcagt ccccaatcct gcttctgggt ggggctgcca 480

gcactctgct gcagaaccgg ggtgcgctcc aggctgttga tcagctgtcc cttttccggc 540

cactctgtaa gttttgtgtg tctgtgcgga gggtgcggga cattgtgccc accctgaggg 600

ccgcgatggc tgccgcccag tcggncaccc caggtccggt gtttgtggag ctgcccgttg 660

acgtgcttta cccctacttc atggtccaga aggagatggt gccagccaag ccacccaagg 720

gcctcgtggg ccgagtggtc tcctggtatt tagagaatta cctggccaac ctctttgcag 780

gagcctggga gcctcagccc gagggaccgc tgcccctgga catcccccag gcttccccgc 840

agcaggttca gcgctgtgtg gagatcctga gccgggccaa gaggcctctg atggtgctgg 900

ggagtcaggc cctgctcacc ccaacgtctg ccgacaagct tcgggctgcc gtggagacct 960

tgggtgttcc ctgcttcctt ggagggatgg cacgggggct gttaggccgc aaccaccccc 1020

tccacatccg ggagaaccgc agtgcggccc tgaagaaggc ggacgtcatt gtcctagcag 1080

gaactgtgtg tgacttccgc ctatcctatg gccgtgtcct cagccacagc agcaagatca 1140

tcatcgtcaa tcgtaatcgg gaagagatgt tgctcaactc agacatcttc tggaagcccc 1200

aggaggctgt gcagggagat gtgggttcct tcgtgctgaa gttagtggag ggccttcagg 1260

gccagacctg ggccccagac tgggtggagg agctgcggga agccgaccgg cagaaggagc 1320

agacctttcg ggagaaggca gcgatgcctg tggcccagca cctgaaccca gtgcaggtgc 1380

tgcagctggt ggaggaaacg ctacctgaca actcaattct ggtggtggat ggcggggact 1440

tcgtgggcac tgctgcccat ctggtacagc cccgcggccc cctgcgctgg ctcgatcctg 1500

gggcctttgg gactctggga gttggtgcag gatttgcact tggggccaag ctgtgccggc 1560

cagatgctga ggtctggtgc ctgtttgggg acggagcttt tggctacagc ctcatcgaat 1620

ttgatacatt cgtcagacac aagatcccag tgatggcctt ggtagggaat gatgctggct 1680

ggacacagat ttctcgggag caggtgccct ctctgggcag caacgtggcc tgtggcctgg 1740

cctacactga ttatcacaag gcagccatgg gtctgggggc ccggggcttg ctgctctcac 1800

gggagaacga ggatcaggtg gtcaaggtgc tgcacgatgc ccagcagcag tgccgagacg 1860

gccacccggt tgtggtcaac atcctcattg ggaggacgga cttccgcgat ggctccattg 1920

ctgtataggg ccttgtgggt caggacgctt ggctgccttc ctgcccctgg actgtgtcca 1980

gctggtttgg agtctcatca ttgcttgccc tgggcctatc ccatgaggcc cagtgactcc 2040

acaacctccc tgaggagggg atggaggggt caaatctcag agaggctctc ttgtgagctc 2100

ttggaccctc ctcttcacgg acccaactgt gccgtttgtc ccctctctta tggagactga 2160

ataaaccacc tctggcccat gtaggcccaa gtaaaaaaaa aaaaaaaaaa aa 2212

<210> 26
<211> 2144
<212> DNA
<213> Homo sapiens

<400> 26
aactgacggg ctttcatttc catttcacac accctagcaa cacttatacc ttgcggaatt 60

gtattggtag cgtgaaaaaa gcacactgag agggcaccat gccggtggaa aggatgcgca 120

tgcgcccgtg gctggaggag cagataaact ccaacacgat cccggggctc aagtggctta 180

acaaggaaaa gaagattttt cagatcccct ggatgcatgc ggctagacat gggtgggatg 240

tggaaaaaga tgcaccactc tttagaaacc gggcaatcca tacaggaaag catcaaccag 300

gagtagataa acctgatccc aaaacatgga aggcgaattt cagatgcgcc atgaattcct 360

tgcctgatat tgaagaagtc aaggataaaa gcataaagaa aggaaataat gccttcaggg 420

tctaccgaat gctgccccta tcagaacggc cttctaagaa aggaaagaaa ccaaagacag 480

aaaaagaaga caaagttaag cacatcaagc aagaaccagt tgagtcatct ctggggctta 540

gtaatggagt aagtgatctt tctcctgagt atgcggtcct gacttcaact ataaaaaatg 600

aagtggatag tacggtgaac atcatagttg taggacagtc ccatctggac agcaacattg 660

agaatcaaga gattgtcacc aatccgccag acatttgcca agttgtagag gtgaccactg 720

agagcgacga gcagccggtc agcatgagcg agctctaccc tctgcagatc tcccccgtgt 780

cttcctatgc agaaagcgaa acgactgata gtgtgcccag cgatgaagag agtgccgagg 840

ggcggccaca ctggcggaag aggaatattg aaggcaaaca gtacctcagc aacatgggga 900

ctcgaggctc ctacctgctg cccggcatgg cgtccttcgt cacttccaac aaaccggacc 960

tccaggtcac catcaaagag gagagcaatc cggtgcctta caacagctcc tggcccccct 1020

ttcaagacct ccccctttct tcctccatga ccccagcatc cagcagcagt cggccagacc 1080

gggagacccg ggccagcgtc atcaagaaaa catcggatat cacccaggcc cgcgtcaaga 1140

gctgttaagc ctctgactct ccgcggtggt tgttggggct tcttggcttt gttttgttgt 1200

ttgtttgtat tttatttttt tctctctgac acctatttta gacaaatcta agggaaaaag 1260

ccttgacaat agaacattga ttgctgtgtc caactccagt acctggagct tctctttaac 1320

tcaggactcc agcccattgg tagacgtgtg tttctagagc ctgctggatc tcccagggct 1380

actcactcaa gttcaaggac caacaagggc agtggaggtg ctgcattgcc tgcggtcaag 1440

gccagcaagg tggagtggat gcctcagaac ggacgagata atgtgaacta gctggaattt 1500

tttattcttg tgaatatgta cataggcagc actagcgaca ttgcagtctg cttctgcacc 1560

ttatcttaaa gcacttacag ataggccttc ttgtgatctt gctctatctc acagcacact 1620

cagcaccccc ttctctgccc attccccagc ctctcttcct atcccatccc atcccatccc 1680

atcccatccc atcccatccc gctcttttcc tacttttcct tccctcaaag cttccattcc 1740

acatccggag gagaagaagg aaatgaattt ctctacagat gtcccatttt cagactgctt 1800

taaaaaaaat ccttctaatc tgctatgctt gaatgccacg cggtacaaag gaaaaagtat 1860

catggaaata ttatgcaaat tcccagattt gaagacaaaa atactctaat tctaaccaga 1920

gcaagctttt ttatttttta tacaggggaa tattttattc aaggtaaaat tctaaataaa 1980

atataattgt tttttatctt ttctacagca aatttataat tttaagattc cttttcttgt 2040

ttatcagcag ttgttattac atccttgtgg cacatttttt tttaattttg taaaggtgaa 2100

aaaagctttt atgagctcat ctagcaatca gattttcctg tgga 2144

<210> 27
<211> 2416
<212> DNA
<213> Homo sapiens

<400> 27
gaacagtgtt accttggagc ctacaatgag aggtatttca aaatgagtga agcatgactc 60

tcacagatga aggcctagac gcaggatctt taatggaaaa acacttgggc cacttcaaga 120

cgacaaacgc tcactgggca aaacaccttc actgaaaaga gacctcatat tatgcaaaaa 180

aaatcttaag aggcctctgc cttcagaagt tacaagatga tcaattcaac ctccacacag 240

cctccagatg aatcctgctc tcagaacctc ctgatcactc agcagatcat tcctgtgctg 300

tactgtatgg tcttcattgc gggaatccta ctcaatggag tgtcaggatg gatattcttt 360

tacgtgccca gctctaagag tttcatcatc tatctcaaga acattgttat tgctgacttt 420

gtgatgagcc tgacttttcc tttcaagatc cttggtgact caggccttgg tccctggcag 480

ctgaacgtgt ttgtgtgcag ggtctctgcc gtgctcttct acgtcaacat gtacgtcagc 540

attgtgttct ttgggctcat cagctttgac aggtattata aaattgtaaa gcctctttgg 600

acttctttca tccagtcagt gagttacagc aaacttctgt cagtgatagt atggatgctc 660

atgctcctcc ttgctgttcc aaatattatt ctcaccaacc agagtgttag ggaggttaca 720

caaataaaat gtatagaact gaaaagtgaa ctgggacgga agtggcacaa agcatcaaac 780

tacatcttcg tggccatctt ctggattgtg tttcttttgt taatcgtttt ctatactgct 840

atcacaaaga aaatctttaa gtcccacctt aagtcaagtc ggaattccac ttcggtcaaa 900

aagaaatcta gccgcaacat attcagcatc gtgtttgtgt tttttgtctg ttttgtacct 960

taccatattg ccagaatccc ctacacaaag agtcagaccg aagctcatta cagctgccag 1020

tcaaaagaaa tcttgcggta tatgaaagaa ttcactctgc tactatctgc tgcaaatgta 1080

tgcttggacc ctattattta tttctttcta tgccagccgt ttagggaaat cttatgtaag 1140

aaattgcaca ttccattaaa agctcagaat gacctagaca tttccagaat caaaagagga 1200

aatacaacac ttgaaagcac agatactttg tgagttccta ccctcttcca aagaaagacc 1260

acgtgtgcat gttgtcatct tcaattacat aacagaaatc aataagatat gtgccctcat 1320

cataaatatc atctctagca ctgccatcca atttagttca ataaaattca aatataagtt 1380

tccatgcttt tttgtaacat caaagaaaac atacccatca gtaatttctc taatactgac 1440

ctttctattc tctattaata aaaaattaat acatacaatt attcaattct attatattaa 1500

aataagttaa agtttataac cactagtctg gtcagttaat gtagaaattt aaatagtaaa 1560

taaaacacaa cataatcaaa gacaactcac tcaggcatct tctttctcta aataccagaa 1620

tctagtatgt aattgttttc aacactgtcc ttaaagacta acttgaaagc aggcacagtt 1680

tgatgaaggg ctagagagct gtttgcaata aaaagtcagg ttttttttcct gatttgaaga 1740

agcaggaaaa gctgacaccc agacaatcac ttaagaaacc ccttattgat gtatttcatg 1800

gcactgcaaa ggaagaggaa tattaattgt atacttagca agaaaatttt ttttttctga 1860

tagcactttg aggatattag atacatgcta aatatgtttt ctacaaagac ttacgtcatt 1920

taatgagcct ggggttctgg tgttagaata tttttaagta ggctttactg agagaaacta 1980

aatattggca tacgttatca gcaacttccc ctgttcaata gtatgggaaa aataagatga 2040

ctgggaaaaa gacacaccca caccgtagaa catatattaa tctactggcg aatgggaaag 2100

gagaccattt tcttagaaag caaataaact tgatttttt aaatctaaaa tttacattaa 2160

tgagtgcaaa ataacacata aaatgaaaat tcacacatca cattttctg gaaaacagac 2220

ggattttact tctggagaca tggcatacgg ttactgactt atgagctacc aaaactaaat 2280

tctttctctg ctattaactg gctagaagac attcatctat ttttcaaatg ttctttcaaa 2340

acatttttat aagtaatgtt tgtatctatt tcatgcttta ctgtctatat actaataaag 2400

aaatgtttta atactg 2416

<210> 28
<211> 756
<212> DNA
<213> Homo sapiens

<400> 28
ctggagacac agatcgaggc tctcaaggag gagctgctct tcatgaagaa gaaccacgaa 60

gaggaagtaa aaggcctaca agcccagatt gccagctctg ggttgaccgt ggaggtagat 120

gccccgaaat ctcaggacct ctccaagatc atggcagaca tccgggccca atatgacgag 180

ctggctcgga agaaccgaga ggagctagac aagtactggt ctcagcagat tgaggagagc 240

accacagtgg tcaccacaca gtctgctgag gttggagctg ctgagacgac gctcacagag 300

ctgagacgta cagtccagtc cttggagatc cgactggacc gcatgagaaa tctgaaggcc 360

agcttggaga acagcctgag ggaggtggag gcccgttacg ccctacagat ggagcagctc 420

aacgggatcc tgctgcacct tgagtcagag ctggcacaga cccgggcaga gggacagcgc 480

caggcccagg agtatgaggc cctgctgaac atcaaggtca agctggaggc tgagatcgcc 540

acctaccgcc gcctgctgga agatggcgag gactttaatc ttggtgatgc cttggacagc 600

agcaactcca tgcaaaccat ccaaaagacc accacccgcc ggatagtgga tggcaaagtg 660

gtgtctgaga ccaatgacac caaagttctg aggcattaag ccagcagaag acgggtacct 720

ttggggagca ggaggccaat aaaaagttca gagttc 756

<210> 29
<211> 1752
<212> DNA
<213> Homo sapiens

<400> 29
ctgctccttc taggatctcc gcctggttcg gcccgcctgc ctccactcct gcctccacca 60

tgtccatcag ggtgacccag aagtcctaca aggtgtccac ctctggcccc cgggccttca 120

gcagccgctc ctacacgagt gggcccggtt cccgcatcag ctcctcgagc ttctcccgag 180

tgggcagcag caactttcgc ggtggcctgg gcggcggcta tggtggggcc agcggcatgg 240

gaggcatcac cgcagttacg gtcaaccaga gcctgctgag ccccccttgtc ctggaggtgg 300

accccaacat ccaggccgtg cgcacccagg agaaggagca gatcaagacc ctcaacaaca 360

agtttgcctc cttcatagac aaggtacggt tcctggagca gcagaacaag atgctggaga 420

ccaagtggag cctcctgcag cagcagaaga cggctcgaag caacatggac aacatgttcg 480

agagctacat caacaacctt aggcggcagc tggagactct gggccaggag aagctgaagc 540

tggaggcgga gcttggcaac atgcaggggc tggtggagga cttcaagaac aagtatgagg 600

atgagatcaa taagcgtaca gagatggaga acgaatttgt cctcatcaag aaggatgtgg 660

atgaagctta catgaacaag gtagagctgg agtctcgcct ggaagggctg accgacgaga 720

tcaacttcct caggcagcta tatgaagagg agatccggga gctgcagtcc cagatctcgg 780

acacatctgt ggtgctgtcc atggacaaca gccgctccct ggacatggac agcatcattg 840

ctgaggtcaa ggcacagtac gaggatattg ccaaccgcag ccgggctgag gctgagagca 900

tgtaccagat caagtatgag gagctgcaga gcctggctgg gaagcacggg gatgacctgc 960

ggcgcacaaa gactgagatc tctgagatga accggaacat cagccggctc caggctgaga 1020

ttgagggcct caaaggccag agggcttccc tggaggccgc cattgcagat gccgagcagc 1080

gtggagagct ggccattaag gatgccaacg ccaagttgtc cgagctggag gccgccctgc 1140

agcgggccaa gcaggacatg gcgcggcagc tgcgtgagta ccaggagctg atgaacgtca 1200

agctggccct ggacatcgag atcgccacct acaggaagct gctggagggc gaggagagcc 1260

ggctggagtc tgggatgcag aacatgagta ttcatacgaa gaccaccagc ggctatgcag 1320

gtggtctgag ctcggcctat gggggcctca caagccccgg cctcagctac agcctgggct 1380

ccagctttgg ctctggcgcg ggctccagct ccttcagccg caccagctcc tccagggccg 1440

tggttgtgaa gaagatcgag acacgtgatg ggaagctggt gtctgagtcc tctgacgtcc 1500

tgcccaagtg aacagctgcg gcagcccctc ccagcctacc cctcctgcgc tgccccagag 1560

cctgggaagg aggccgctat gcagggtagc actgggaaca ggagacccac ctgaggctca 1620

gccctagccc tcagcccacc tggggagttt actacctggg gacccccctt gcccatgcct 1680

ccagctacaa aacaattcaa ttgctttttt tttttggtcc aaaataaaac ctcagctagc 1740

tctgccaaac cc 1752

<210> 30
<211> 1744
<212> DNA
<213> Homo sapiens

<400> 30
tgaggcctga ctttttcaat aaaacattgt gtagttctgg gcctcctgct gccccggctc 60

tgtttccccc ggcgccaaga gaagaaggcg gaactgaacc caggcccaga gccggctccc 120

tgaggctgtg ccccttttccg gcaatctctg gccacaaccc ccactggcca ggccgtcccc 180

cccactggcc ctagggcccc tcccactccc acaccagata aggacagccc agtgccgctt 240

tctctggcag taggcaccag ggctggaatg gggccgcccg gctccccatg gcagtgggtg 300

acgctgctgc tggggctgct gctccctcct gccgcccccc tctggctcct caatgtgctc 360

ttccccccgc acaccacgcc caaggctgag ctcagtaacc acacacggcc cgtcatcctc 420

gtgcccggct gcctggggaa tcagctagaa gccaagctgg acaaaccaga tgtggtgaac 480

tggatgtgct accgcaagac agaggacttc ttcaccatct ggctggatct caacatgttc 540

ctacccctg gggtagactg ctggatcgat aacaccaggg ttgtctacaa ccggagctct 600

gggctcgtgt ccaacgcccc tggtgtccag atccgcgtcc ctggctttgg caagacctac 660

tctgtggagt acctggacag cagcaagctg gcagggtacc tgcacacact ggtgcagaac 720

ctggtcaaca atggctacgt gcgggacgag actgtgcgcg ccgcccccta tgactggcgg 780

ctggagcccg gccagcagga ggagtactac cgcaagctcg cagggctggt ggaggagatg 840

cacgctgcct atgggaagcc tgtcttcctc attggccaca gcctcggctg tctacacttg 900

ctctatttcc tgctgcgcca gccccaggcc tggaaggacc gctttattga tggcttcatc 960

tctcttgggg ctccctgggg tggctccatc aagcccatgc tggtcttggc ctcaggtgac 1020

aaccagggca tccccatcat gtccagcatc aagctgaaag aggagcagcg cataaccacc 1080

acctcccct ggatgtttcc ctctcgcatg gcgtggcctg aggaccacgt gttcatttcc 1140

acacccagct tcaactacac aggccgtgac ttccaacgct tctttgcaga cctgcacttt 1200

gaggaaggct ggtacatgtg gctgcagtca cgtgacctcc tggcaggact cccagcacct 1260

ggtgtggaag tatactgtct ttacggcgtg ggcctgccca cgccccgcac ctacatctac 1320

gaccacggct tcccctacac ggaccctgtg ggtgtgctct atgaggatgg tgatgacacg 1380

gtggcgaccc gcagcaccga gctctgtggc ctgtggcagg gccgccagcc acagcctgtg 1440

cacctgctgc ccctgcacgg gatacagcat ctcaacatgg tcttcagcaa cctgaccctg 1500

gagcacatca atgccatcct gctgggtgcc taccgccagg gtcccctgc atccccgact 1560

gccagcccag agcccccgcc tcctgaataa agaccttcct ttgctaccgt aagccctgat 1620

ggctatgttt caggttgaag ggaggcacta gagtcccaca ctaggtttca ctcctcacca 1680

gccacaggct cagtgctgtg tgcagtgagg caagatgggc tctgctgagg cctgggactg 1740

agct 1744

<210> 31
<211> 507
<212> DNA
<213> Homo sapiens

<400> 31
cttctgacag ctggtgcgcc tgcccgggaa catcctcctg gactcaatca tggcttgtgg 60

tctggtcgcc agcaacctga atctcaaacc tggagagtgc cttcgagtgc gaggcgaggt 120

ggctcctgac gctaagagct tcgtgctgaa cctgggcaaa gacagcaaca acctgtgcct 180

gcacttcaac cctcgcttca acgcccacgg cgacgccaac accatcgtgt gcaacagcaa 240

ggacggcggg gcctggggga ccgagcagcg ggaggctgtc tttcccttcc agcctggaag 300

tgttgcagag gtgtgcatca ccttcgacca ggccaacctg accgtcaagc tgccagatgg 360

atacgaattc aagttcccca accgcctcaa cctggaggcc atcaactaca tggcagctga 420

cggtgacttc aagatcaaat gtgtggcctt tgactgaaat cagccagccc atggccccca 480

ataaaggcag ctgcctctgc tcccctg 507

<210> 32
<211> 672
<212> DNA
<213> Homo sapiens

<400> 32
aatataactt tttctttttt tatttaaata agtcttataa atgtgggaaa aaattatctt 60

gtgttccttt aatttcattt ttatttaata ctattttcag aatgaacaaa agattgaaaa 120

attatttaga attttttttct gtgctttttc ctgtttcaga taaaggagat gggtgagatg 180

catagggaac tcaatgcata actatataat ttgaagatta tagaagaagg gaaatagcaa 240

atggacacaa attacaaatg tgtgtgcgtg ggacgaagac atctttgaag gtcatgagtt 300

tgttagttta acatcatata tttgtaatag tgaaacctgt actcaaaata taagcagctt 360

gaaactggct ttaccaatct tgaaatttga ccacaagtgt cttatatatg cagatctaat 420

gtaaaatcca gaacttggac tccatcgtta aaattattta tgtgtaacat tcaaatgtgt 480

gcattaaata tgcttccaca gtaaaatctg aaaaactgat ttgtgattga aagctgcctt 540

tctatttact tgagtcttgt acatacatac ttttttatga gctatgaaat aaaacatttt 600

aaactgaatt tcttaacttt gacatttcaa atttcttctt ctttttcttt tctttttttt 660

ttttttttga ga 672

<210> 33
<211> 3270
<212> DNA
<213> Homo sapiens

<220>
<221> Unsure
<222> (2708)..(2708)
<223> n = a, c, g or t/u

<220>
<221> Unsure
<222> (2746)..(2746)
<223> n = a, c, g or t/u

<400> 33
caaaaagtgt gtggaaaggt ggattgaggg agcgggaccc ccgcgggacc cgaggggcg 60

gcaggcgggg aacggggagt cagcccgcgc tgtgtctcgg ggccggccgg caggaaggag 120

ccatggctct ggacgggata aggatgccag atggctgcta cgcggacggg acgtgggaac 180

tgagtgtcca tgtgacggac ctgaaccgcg atatcaccct gagagtgacc ggcgaggtgc 240

acattggagg cgtgatgctt aagctggtgg agaaactcga tgtaaaaaaa gattggtctg 300

accatgctct ctggtgggaa aagaagagaa cttggcttct gaagacacat tggaccttag 360

ataagtatgg tattcaggca gatgctaagc ttcagttcac ccctcagcac aaactgctcc 420

gcctgcagct tcccaacatg aagtatgtga aggtgaaagt gaatttctct gatagagtct 480

tcaaagctgt ttctgacatc tgtaagactt ttaatatcag acaccccgaa gaactttctc 540

tcttaaagaa acccagagat ccaacaaaga aaaaaaagaa gaagctagat gaccagtctg 600

aagatgaggc acttgaatta gaggggcctc ttatcactcc tggatcagga agtatatatt 660

caagcccagg actgtatagt aaaacaatga cccccactta tgatgctcat gatggaagcc 720

ccttgtcacc aacttctgct tggtttggtg acagtgcttt gtcagaaggc aatcctggta 780

tacttgctgt cagtcaacca atcacgtcac cagaaatctt ggcaaaaatg ttcaagcctc 840

aagctcttct tgataaagca aaaatcaacc aaggatggct tgattcctca agatctctca 900

tggaacaaga tgtgaaggaa aatgaggcct tgctgctccg attcaagtat tacagctttt 960

ttgatttgaa tccaaagtat gatgcaatca gaatcaatca gctttatgag caggccaaat 1020

gggccattct cctggaagag attgaatgca cagaagaaga aatgatgatg tttgcagccc 1080

tgcagtatca tatcaataag ctgtcaatca tgacatcaga gaatcatttg aacaacagtg 1140

acaaagaagt tgatgaagtt gatgctgccc tttcagacct ggagattact ctggaagggg 1200

gtaaaacgtc aacaattttg ggtgacatta cttccattcc tgaacttgct gactacatta 1260

aagttttcaa gccaaaaaag ctgactctga aaggttacaa acaatattgg tgcaccttca 1320

aagacacatc catttcttgt tataagagca aagaagaatc cagtggcaca ccagctcatc 1380

agatgaacct caggggatgt gaagttaccc cagatgtaaa catttcaggc caaaaattta 1440

acattaaact cctgattcca gttgcagaag gcatgaatga aatctggctt cgttgtgaca 1500

atgaaaaaca gtatgcacac tggatggcag cctgcagatt agcctccaaa ggcaagacca 1560

tggcggacag ttcttacaac ttagaagttc agaatattct ttcctttctg aagatgcagc 1620

atttaaaccc agatcctcag ttaataccag agcagatcac gactgatata actcctgaat 1680

gtttggtgtc tccccgctat ctaaaaaagt ataagaacaa gcagataaca gcgagaatct 1740

tggaggccca tcagaatgta gctcagatga gtctaattga agccaagatg agatttattc 1800

aagcttggca gtcactacct gaatttggca tcactcactt cattgcaagg ttccaagggg 1860

gcaaaaaaga agaacttatt ggaattgcat acaacagact gattcggatg gatgccagca 1920

ctggagatgc aattaaaaca tggcgtttca gcaacatgaa acagtggaat gtcaactggg 1980

aaatcaaaat ggtcaccgta gagtttgcag atgaagtacg attgtccttc atttgtactg 2040

aagtagattg caaagtggtt catgaattca ttggtggcta catatttctc tcaacacgtg 2100

caaaagacca aaacgagagt ttagatgaag agatgttcta caaacttacc agtggttggg 2160

tgtgaataga aatactgttt aatgaaactc cacggccata acaatattta actttaaaag 2220

ctgtttgtta tatgctgctt aataaagtaa gcttgaaatt tatcatttta tcatgaaaac 2280

ttctttgcct taccagacca gttaatatgt gcactaaaca agcacgacta ttaatctatc 2340

atgttatgat ataataaact tgaatttggc acacattcct tagggccatg aattgaaaac 2400

tgaaatagtg ggcaaatcag gaacaaacca tcactgattt actgatttaa gctagccaaa 2460

ctgtaagaaa caagccatct attttaaagc tatccagggc ttaacctata tgaactctat 2520

ttatcatgtc taatgcatgt gatttaatgt atgtttaatt tgatatcatg ttttaaaata 2580

tcctacttct ggtagccatt taattcctcc ccctaccccc aaataaatca ggcatgcagg 2640

aggcctgata tttagtaatg tcattgtgtt tgaccttgaa ggaaaatgct attagtccgt 2700

cgtgcttnat ttgtttttgt ccttgaataa gcatgttatg tatatngtct cgtgttttta 2760

tttttacacc atattgtatt acacttttag tattcaccag cataancact gtctgcctaa 2820

aatatgcaac tctttgcatt acaatatgaa gtaaagttct atgaagtatg cattttgtgt 2880

aactaatgta aaaacacaaa ttttataaaa ttgtacagtt ttttaaaaac tactcacaac 2940

tagcagatgg cttaaatgta gcaatctctg cgttaattaa atgcctttaa gagatataat 3000

taacgtgcag ttttaatatc tactaaatta agaatgactt cattatgatc atgatttgcc 3060

acaatgtcct taactctaat gcctggactg gccatgttct agtctgttgc gctgttacaa 3120

tctgtattgg tgctagtcag aaaattccta gctcacatag cccaaaaggg tgcgagggag 3180

aggtggatta ccagtattgt tcaataatcc atggttcaaa gactgtataa atgcatttta 3240

ttttaaataa aagcaaaact tttatttaaa 3270

<210> 34
<211> 3437
<212> DNA
<213> Homo sapiens

<400> 34
aagttcagtg cctaccgaag acaaaggcgc cccgagggag tggcggtgcg accccagggc 60

gtgggcccgg ccgcggagcc cacactgccc ggctgacccg gtggtctcgg accatgtctc 120

ccgccccaag acccccccgt tgtctcctgc tccccctgct cacgctcggc accgcgctcg 180

cctccctcgg ctcggcccaa agcagcagct tcagccccga agcctggcta cagcaatatg 240

gctacctgcc tcccggggac ctacgtaccc acacacagcg ctcaccccag tcactctcag 300

cggccatcgc tgccatgcag aagttttacg gcttgcaagt aacaggcaaa gctgatgcag 360

acaccatgaa ggccatgagg cgcccccgat gtggtgttcc agacaagttt ggggctgaga 420

tcaaggccaa tgttcgaagg aagcgctacg ccatccaggg tctcaaatgg caacataatg 480

aaatcacttt ctgcatccag aattacaccc ccaaggtggg cgagtatgcc acatacgagg 540

ccattcgcaa ggcgttccgc gtgtgggaga gtgccacacc actgcgcttc cgcgaggtgc 600

cctatgccta catccgtgag ggccatgaga agcaggccga catcatgatc ttctttgccg 660

agggcttcca tggcgacagc acgcccttcg atggtgaggg cggcttcctg gcccatgcct 720

acttcccagg ccccaacatt ggaggagaca cccactttga ctctgccgag ccttggactg 780

tcaggaatga ggatctgaat ggaaatgaca tcttcctggt ggctgtgcac gagctgggcc 840

atgccctggg gctcgagcat tccagtgacc cctcggccat catggcaccc ttttaccagt 900

ggatggacac ggagaatttt gtgctgcccg atgatgaccg ccggggcatc cagcaacttt 960

atgggggtga gtcagggttc cccaccaaga tgccccctca acccaggact acctcccggc 1020

cttctgttcc tgataaaccc aaaaacccca cctatgggcc caacatctgt gacgggaact 1080

ttgacaccgt ggccatgctc cgaggggaga tgtttgtctt caaggagcgc tggttctggc 1140

gggtgaggaa taaccaagtg atggatggat acccaatgcc cattggccag ttctggcggg 1200

gcctgcctgc gtccatcaac actgcctacg agaggaagga tggcaaattc gtcttcttca 1260

aaggagacaa gcattgggtg tttgatgagg cgtccctgga acctggctac cccaagcaca 1320

ttaaggagct gggccgaggg ctgcctaccg acaagattga tgctgctctc ttctggatgc 1380

ccaatggaaa gacctacttc ttccgtggaa acaagtacta ccgtttcaac gaagagctca 1440

gggcagtgga tagcgagtac cccaagaaca tcaaagtctg ggaagggatc cctgagtctc 1500

ccagagggtc attcatgggc agcgatgaag tcttcactta cttctacaag gggaacaaat 1560

actggaaatt caacaaccag aagctgaagg tagaaccggg ctaccccaag tcagccctga 1620

gggactggat gggctgccca tcgggaggcc ggccggatga ggggactgag gaggagacgg 1680

aggtgatcat cattgaggtg gacgaggagg gcggcggggc ggtgagcgcg gctgccgtgg 1740

tgctgcccgt gctgctgctg ctcctggtgc tggcggtggg ccttgcagtc ttcttcttca 1800

gacgccatgg gacccccagg cgactgctct actgccagcg ttccctgctg gacaaggtct 1860

gacgcccacc gccggcccgc ccactcctac cacaaggact ttgcctctga aggccagtgg 1920

cagcaggtgg tggtgggtgg gctgctccca tcgtcccgag ccccctcccc gcagcctcct 1980

tgcttctctc tgtcccctgg ctggcctcct tcaccctgac cgcctccctc cctcctgccc 2040

cggcattgca tcttccctag ataggtcccc tgagggctga gtgggagggc ggcccttcc 2100

agcctctgcc cctcagggga accctgtagc tttgtgtctg tccagcccca tctgaatgtg 2160

ttgggggctc tgcacttgaa ggcaggaccc tcagacctcg ctggtaaagg tcaaatgggg 2220

tcatctgctc cttttccatc ccctgacata ccttaacctc tgaactctga cctcaggagg 2280

ctctgggcac tccagccctg aaagccccag gtgtacccaa ttggcagcct ctcactactc 2340

tttctggcta aaaggaatct aatcttgttg agggtagaga ccctgagaca gtgtgagggg 2400

gtggggactg ccaagccacc ctaagacctt gggaggaaaa ctcagagagg gtcttcgttg 2460

ctcagtcagt caagttcctc ggagatctgc ctctgcctca cctaccccag ggaacttcca 2520

aggaaggagc ctgagccact ggggactaag tgggcagaag aaacccttgg cagccctgtg 2580

cctctcgaat gttagccttg gatggggctt tcacagttag aagagctgaa accaggggtg 2640

cagctgtcag gtagggtggg gccggtggga gaggcccggg tcagagccct gggggtgagc 2700

ctgaaggcca cagagaaaga accttgccca aactcaggca gctggggctg aggcccaaag 2760

gcagaacagc cagagggggc aggaggggac caaaaaggaa aatgaggacg tgcagcagca 2820

ttggaaggct ggggccgggc aggccaggcc aagccaagca gggggccaca gggtgggctg 2880

tggagctctc aggaagggcc ctgaggaagg cacacttgct cctgttggtc cctgtccttg 2940

ctgcccaggc agcgtggagg ggaagggtag ggcagccaga gaaaggagca gagaaggcac 3000

acaaacgagg aatgaggggc ttcacgagag gccacagggc ctggctggcc acgctgtccc 3060

ggcctgctca ccatctcagt gaggggcagg agctggggct cgcttaggct gggtccacgc 3120

ttccctggtg ccagcacccc tcaagcctgt ctcaccagtg gcctgccctc tcgctccccc 3180

acccagccca cccattgaag tctccttggg ccaccaaagg tggtggccat ggtaccgggg 3240

acttgggaga gtgagaccca gtggagggag caagaggaga gggatgtcgg gggggtgggg 3300

cacggggtag gggaaatggg gtgaacggtg ctggcagttc ggctagattt ctgtcttgtt 3360

tgtttttttg ttttgtttaa tgtatatttt tattataatt attatatatg aattccaaaa 3420

aaaaaaaaaa aaaaaaa 3437

<210> 35
<211> 4898
<212> DNA
<213> Homo sapiens

<400> 35
gaattccggc tgccaggggc gtccggttac atccccgcct tcctctgtcc tggccgcggg 60

accgggtttg cgggaccgca gttcgggaac atgttggcct cgagcagccg gatccgggct 120

gcgtggacgc gggcgctgct gctgccgctg ctgctggcgg ggcctgtggg ctgcctgagc 180

cgccaggagc tctttccctt cggccccgga cagggggacc tggagctgga ggacggggat 240

gacttcgtct ctcctgccct ggagctgagt ggggcgctcc gcttctacga cagatccgac 300

atcgacgcag tctacgtcac cacaaatggc atcattgcta cgagtgaacc cccggccaaa 360

gaatcccatc ccgggctctt cccaccaaca ttcggtgcag tcgccccttt cctggcggac 420

ttggacacga ccgatggcct ggggaaggtt tattatcgag aagacttatc cccctccatc 480

actcagcgag cagcagagtg tgtccacaga gggttcccgg agatctcttt ccagcctagt 540

agcgcggtgg ttgtcacttg ggaatccgtg gccccctacc aagggcccag cagggaccca 600

gaccagaaag gcaagagaaa cacgttccag gctgttctag cctcctctga ttccagctcc 660

tatgccattt tcctttatcc tgaggatggt ctgcagttcc atacgacatt ctcaaagaag 720

gaaaacaacc aagttcctgc cgtggttgca ttcagtcaag gttcagtggg attcttatgg 780

aagagcaacg gagcttataa catatttgct aatgacaggg aatcaattga aaatttggcc 840

aagagtagta actctgggca gcagggtgtc tgggtgtttg agattgggag tccagccacc 900

accaatggcg tggtgcctgc agacgtgatc ctcggaactg aagatggggc agagtatgat 960

gatgaggatg aagattatga cctggcgacc actcgtctgg gcctggagga tgtgggcacc 1020

acgcccttct cctacaaggc tctgagaagg ggaggtgctg acacatacag tgtgcccagc 1080

gtcctctccc cgcgccgggc agctaccgaa aggccccttg gacctcccac agagagaacc 1140

aggtctttcc agttggcagt ggagactttt caccagcagc accctcaggt catagatgtg 1200

gatgaagttg aggaaacagg agttgttttc agctataaca cggattcccg ccagacgtgt 1260

gctaacaaca gacaccagtg ctcggtgcac gcagagtgca gggactacgc cacgggcttc 1320

tgctgcagct gtgtcgctgg ctatacgggc aatggcaggc aatgtgttgc agaaggttcc 1380

ccccagcgag tcaatggcaa ggtgaaagga aggatctttg tggggagcag ccaggtcccc 1440

attgtctttg agaacactga cctccactct tacgtagtaa tgaaccacgg gcgctcctac 1500

acagccatca gcaccattcc cgagaccgtt ggatattctc tgcttccact ggccccagtt 1560

ggaggcatca ttggatggat gtttgcagtg gagcaggacg gattcaagaa tgggttcagc 1620
atcaccgggg gtgagttcac tcgccaggct gaggtgacct tcgtggggca cccgggcaat 1680
ctggtcatta agcagcggtt cagcggcatc gatgagcatg ggcacctgac catcgacacg 1740
gagctggagg gccgcgtgcc gcagattccg ttcggctcct ccgtgcacat tgagccctac 1800
acggagctgt accactactc cacctcagtg atcacttcct cctccacccg ggagtacacg 1860
gtgactgagc ccgagcgaga tggggcatct ccttcacgca tctacactta ccagtggcgc 1920
cagaccatca ccttccagga atgcgtccac gatgactccc ggccagccct gcccagcacc 1980
cagcagctct cggtggacag cgtgttcgtc ctgtacaacc aggaggagaa gatcttgcgc 2040
tacgctttca gcaactccat tgggcctgtg agggaaggct cccctgatgc tcttcagaat 2100
ccctgctaca tcggcactca tgggtgtgac accaacgcgg cctgtcgccc tggtcccagg 2160
acacagttca cctgcgagtg ctccatcggc ttccgaggag acgggcgaac ctgctatgat 2220
attgatgaat gttcagaaca accctcagtg tgtgggagcc acacaatctg caataatcac 2280
ccaggaacct tccgctgcga gtgtgtggag ggctaccagt tttcagatga gggaacgtgt 2340
gtggctgtcg tggaccagcg ccccatcaac tactgtgaaa ctggccttca taactgcgac 2400
ataccccagc gggcccagtg tatctacaca ggaggctcct cctacacctg ttcctgcttg 2460
ccaggctttt ctggggatgg ccaagcctgc caagatgtag atgaatgcca gccaagccga 2520
tgtcaccctg acgccttctg ctacaacact ccaggctctt tcacgtgcca gtgcaaacct 2580
ggttatcagg gagacggctt ccgttgcgtg cccggagagg tggagaaaac ccggtgccag 2640
cacgagcgag aacacattct cggggcagcg ggggcgacag acccacagcg acccattcct 2700
ccggggctgt tcgttcctga gtgcgatgcg cacgggcact acgcgcccac ccagtgccac 2760
ggcagcaccg gctactgctg gtgcgtggat cgcgacggcc gcgaggtgga gggcaccagg 2820
accaggcccg ggatgacgcc cccgtgtctg agtacagtgg ctcccccgat tcaccaagga 2880
cctgcggtgc ctaccgccgt gatccccttg cctcctggga cccatttact ctttgcccag 2940
actgggaaga ttgagcgcct gcccctggag ggaaatacca tgaggaagac agaagcaaag 3000
gcgttccttc atgtcccggc taaagtcatc attggactgg cctttgactg cgtggacaag 3060
atggtttact ggacggacat cactgagcct tccattggga gagctagtct acatggtgga 3120
gagccaacca ccatcattag acaagatctt ggaagtccag aaggtatcgc tgttgatcac 3180
cttggccgca acatcttctg gacagactct aacctggatc gaatagaagt ggcgaagctg 3240
gacggcacgc agcgccgggt gctctttgag actgacctgg tgaatcccag aggcattgta 3300
acggattccg tgagagggaa cctttactgg acagactgga acagagataa ccccaagatt 3360

gaaacttcct acatggacgg cacgaaccgg aggatccttg tgcaggatga cctgggcttg 3420

cccaatggac tgcacttcga tgcgttctca tctcagctct gctgggtgga tgcaggcacc 3480

aatcgggcgg aatgcctgaa ccccagtcag cccagcagac gcaaggctct cgaagggctc 3540

cagtatcctt ttgctgtgac gagctacggg aagaatctgt atttcacaga ctggaagatg 3600

aattccgtgg ttgctctcga tcttgcaatt tccaaggaga cggatgcttt ccaaccccac 3660

aagcagaccc ggctgtatgg catcaccacg gccctgtctc agtgtccgca aggccataac 3720

tactgctcag tgaacaatgg cggctgcacc cacctatgct tggccacccc agggagcagg 3780

acctgccgtt gccctgacaa caccttggga gttgactgta tcgaacggaa atgaagacaa 3840

gagtgcctta tttcctttcc aagtatttca cagcaacact ctacttgaag caacttggtc 3900

cagattgaaa agtgtcctct ggctgagtgg ccactaggcc cagacccagc ccagcctgag 3960

ccccaacaac aacttttccc tcactgttcc ccaaaacatg caccctggac ttctctaata 4020

gaaaagtctc cacccctaca caaggacaga accctccacc cctaccccca accctcagac 4080

agacttatac acccctgagt gaggattaca tgcccatccc agtgtcctag gacctttcc 4140

caatactagc cccccagtgg tgaacagaac ctcccaaatt tgagttgcac ccttccctgt 4200

ggccttatga gctcagcctc gctttgaggt acccaccgtc ctgtcagctc cttgacctat 4260

gagctggggc ctgactagga aaagttggga gttaaggagg aaattagcat tccttaatgt 4320

tttgttttgg tgctctgaat ttcttcttta ttatagtcct atagttttac tcctcagttc 4380

ctcaccatca tcatcttgtc taagaccccc attatatatat tcatgcgctg ctttttcatc 4440

aaaacctacc ctgtcctaga gatctatggg catttggtgg atgataatga gcagcccctc 4500

ccagatagaa tgtcaatatt tgagcagtag gatattggca tttgttagtt aaaggcttaa 4560

atcaaaagaa tgtccaatgg taggaatttc aaggtgtagg tcagatattt gagaataggg 4620

gatttttttg atgtgcctta aattatacca aagattacta attattcctc tttgcccaaa 4680

atacttgcat ccaaggttct agtctctgtt gctgtgctgg tctttagccc cactgctggc 4740

actgatgtcc ctccttttttc acggagacct atctgaggta caggatgggg ctggcaccag 4800

atgatgtccc accacagtcc ctcacctccg gcctccacat gacagaacca atttacactc 4860

aaccatgacc tcacccctcc ttggtttctc cctccccg 4898

<210> 36
<211> 2511
<212> DNA
<213> Homo sapiens

<400> 36

cgccgcctgt gccatttctg attttgcaac ttggggaaga agaaaaaagc gagagaaggg 60

agcttgctcg ccgggggggtg gggaggggggg aaggagagcg cggccccccc aggaacggag 120

cgcgggggga gcgggcgagg ggagcagggg tgttgggggg ggagcctgag agcctggggg 180

ggctgcaaaa agagagaaag aaaacagcag gaaccacaac aaaacgccag cagggcgggc 240

gggcgcgcag cagcagcggg gcggccgagg cagtagcggc ggcagcggcg gcggcggcgg 300

aggcagcggc cggtgtccgg ctcgggctcg gctcctgcga ccccggggcg cccggcgggc 360

cccccgcccc ctccccctcc ccccttcccc ttcccccttcc cctcccagcg cgcccgcgcg 420

ccccgcggcc ctcggcgagc agctcggctc cccccagcgc tccccgggcc caaagatatg 480

gcaatggtag ttagcagctg gcgagatccg caggacgacg tggccggggg caaccccggc 540

ggccccaacc ccgcagcgca ggcggcccgc ggcggcggcg gcggcgccgg cgagcagcag 600

cagcaggcgg gctcgggcgc gccgcacacg ccgcagaccc cgggccagcc cggagcgccc 660

gccacccccg gcacggcggg ggacaagggc cagggcccgc ccggttcggg ccagagccag 720

cagcacatcg agtgcgtggt gtgcggggac aagtcgagcg gcaagcacta cggccaattc 780

acctgcgagg gctgcaaaag tttcttcaag aggagcgtcc gcaggaactt aacttacaca 840

tgccgtgcca acaggaactg tcccatcgac cagcaccacc gcaaccagtg ccaatactgc 900

cgcctcaaga agtgcctcaa agtgggcatg aggcgggaag cggttcagcg aggaagaatg 960

cctccaaccc agcccaatcc aggccagtac gcactcacca acggggaccc cctcaacggc 1020

cactgctacc tgtccggcta catctcgctg ctgctgcgcg ccgagcccta ccccacgtcg 1080

cgctacggca gccagtgcat gcagcccaac aacattatgg gcatcgagaa catctgcgag 1140

ctggccgcgc gcctgctctt cagcgccgtc gagtgggccc gcaacatccc cttcttcccg 1200

gatctgcaga tcaccgacca ggtgtccctg ctacgcctca cctggagcga gctgttcgtg 1260

ctcaacgcgg cccagtgctc tatgccgctg cacgtggcgc cgttgctggc cgccgccggc 1320

ctgcatgcct cgcccatgtc tgccgaccgc gtcgtggcct tcatggacca catccgcatc 1380

ttccaggagc aggtggagaa gctcaaggcg ctacacgtcg actcagccga gtacagctgc 1440

ctcaaagcca tcgtgctgtt cacgtcagac gcctgtggcc tgtcggatgc ggcccacatc 1500

gagagcctgc aggagaagtc gcagtgcgca ctggaggagt acgtgaggag ccagtacccc 1560

aaccagccca gccgttttgg caaactgctg ctgcgactgc cctcgctgcg caccgtgtcc 1620

tcctccgtca tcgagcagct cttcttcgtc cgtttggtag gtaaaacccc catcgaaact 1680

ctcatccgcg atatgttact gtctgggagc agcttcaact ggccttacat gtccatccag 1740

tgctcctaga ccttgggcgc ttcccacctg ccccgtcccc ctagagactc agaggaccca 1800

cctgggccaa ggactccaaa gccgcgggga caccgggaag tgcagcgggc caggcaggct 1860

gggtgggagg gaggagggcc gagacaggag cagcccaccc agcagaaata caatccgagc 1920

tacaaagcat gggaaaaaga gactctttta ggatcagatc tgtgagcacg ttggcgagga 1980

aaaacaaaac aaacaaaaaa aagaaccttg tgtctgtctg gtgaaaaaaa gaaaaacaaa 2040

ttggaagaga ggaccatgag aattttaata aaacagaagg aaactaatgg accttccagg 2100

atttattgtg gacggatgtg gatatattct gtacaggaac aacacatatg gaagtggact 2160

gaagcctatg tagaaacaca cacacactga acattgttat tcattttgta aaatactagt 2220

ctttattttc atttttgta aaatttaaac atcgtatgcg cataaagaaa aaggaaacaa 2280

gaattagggg aaaataacat tttccaaata attataaaaa attgtcctgt gtctatgtat 2340

ctatatctgt tttgtatttt tttctggttc caaaccagat ttcctgtgat tctatactaa 2400

taatttttga tataaccctt tgcttcttat aatgagtgcg atatatgttg tcgaggctgt 2460

tcttcaagaa ttaaaattga agtgaaaatt taaacaaaaa taaaagaatt g 2511

<210> 37
<211> 2722
<212> DNA
<213> Homo sapiens

<400> 37
gagcgggctg agggtaggaa gtagccgctc cgagtggagg cgactggggg ctgaagagcg 60

cgccgccctc tcgtcccact ttccaggtgt gtgatcctgt aaaattaaat cttccaagat 120

gatctggtat atattaatta taggaattct gcttccccag tctttggctc atccaggctt 180

ttttacttca attggtcaga tgactgattt gatccatact gagaaagatc tggtgacttc 240

tctgaaagat tatattaagg cagaagagga caagttagaa caaataaaaa aatgggcaga 300

gaagttagat cggctaacta gtacagcgac aaaagatcca gaaggatttg ttgggcatcc 360

agtaaatgca ttcaaattaa tgaaacgtct gaatactgag tggagtgagt tggagaatct 420

ggtccttaag gatatgtcag atggctttat ctctaaccta accattcaga gaccagtact 480

ttctaatgat gaagatcagg ttggggcagc caaagctctg ttacgtctcc aggataccta 540

caatttggat acagatacca tctcaaaggg taatcttcca ggagtgaaac acaaatcttt 600

tctaacggct gaggactgct ttgagttggg caaagtggcc tatacagaag cagattatta 660

ccatacggaa ctgtggatgg aacaagccct aaggcaactg gatgaaggcg agatttctac 720

catagataaa gtctctgttc tagattattt gagctatgcg gtatatcagc agggagacct 780

ggataaggca cttttgctca caaagaagct tcttgaacta gatcctgaac atcagagagc 840

taatggtaac ttaaaatatt ttgagtatat aatggctaaa gaaaaagatg tcaataagtc 900

tgcttcagat gaccaatctg atcagaaaac tacacgaaag aaaaaagggg ttgctgtgga 960

ttacctgcca gagagacaga agtacgaaat gctgtgccgt ggggagggta tcaaaatgac 1020

ccctcggaga cagaaaaaac tcttttgccg ctaccatgat ggaaaccgta atcctaaatt 1080

tattctggct ccagctaaac aggaggatga atgggacaag cctcgtatta ttcgcttcca 1140

tgatattatt tctgatgcag aaattgaaat cgtcaaagac ctagcaaaac caaggctgag 1200

ccgagctaca gtacatgacc ctgagactgg aaaattgacc acagcacagt acagagtatc 1260

taagagtgcc tggctctctg gctatgaaaa tcctgtggtg tctcgaatta atatgagaat 1320

acaagatcta acaggactag atgtttccac agcagaggaa ttacaggtag caaattatgg 1380

agttggagga cagtatgaac cccattttga ctttgcacgg aaagatgagc cagatgcttt 1440

caaagagctg gggacaggaa atagaattgc tacatggctg ttttatatga gtgatgtgtc 1500

tgcaggagga gccactgttt ttcctgaagt tggagctagt gtttggccca aaaaaggaac 1560

tgctgttttc tggtataatc tgtttgccag tggagaagga gattatagta cacggcatgc 1620

agcctgtcca gtgctagttg gcaacaaatg ggtatccaat aaatggctcc atgaacgtgg 1680

acaagaattt cgaagacctt gtacgttgtc agaattggaa tgacaaacag gcttcccttt 1740

ttctcctatt gttgtactct tatgtgtctg atatacacat ttccatagtc ttaactttca 1800

ggagtttaca attgactaac actccatgat tgattcagtc atgaacctca tcccatgttt 1860

catctgtgga caattgctta ctttgtgggt tcttttaaaa gtaacacgaa atcatcatat 1920

tgcataaaac cttaaagttc tgttggtatc acagaagaca aggcagagtt taaagtgagg 1980

aattttatat ttaaagaact ttttggttgg ataaaaacat aatttgagca tccagtttta 2040

gtatttcact acatctcagt tggtgggtgt taagctagaa tgggctgtgt gataggaaac 2100

aaatgcctta cagatgtgcc taggtgttct gtttacctag tgtcttactc tgttttctgg 2160

atctgaagac tagtaataaa ctaggacact aactgggttc catgtgattg ccctttcata 2220

tgatcttcta agttgatttt tttcctccca agtctttttt aaagaaagta tactgtattt 2280

taccaacccc ctctcttttc ttttagctcc tctgtggtga attaaacgta cttgagttaa 2340

aatatttcga ttttttttct ttttttaatg gaaagtcctg cataacaaca ctgggccttc 2400

ttaactaaaa tgctcaccac ttagcctgtt tttttatccc ttttttaaaa tgacagatga 2460

ttttgttcag gaattttgct gtttttctta gtgctaatac cttgcctctt attcctgcta 2520

cagcagggtg gtaatattgg cattctgatt aaatactgtg ccttaggaga ctggaagttt 2580

aaaaatgtac aagtcctttc agtgatgagg gaattgattt tttttaaaag tctttttctt 2640

agaaagccaa aatgtttgtt tttttaagat tctgaaatgt gttgtgacaa caatgaccta 2700

tttatgatct taaatctttt tt 2722

<210> 38
<211> 811
<212> DNA
<213> Homo sapiens

<400> 38
catccctctg gctccagagc tcagagccac ccacagccgc agccatgctg tgcctcctgc 60

tcaccctggg cgtggccctg gtctgtggtg tcccggccat ggacatcccc cagaccaagc 120

aggacctgga gctcccaaag ttggcaggga cctggcactc catggccatg gcgaccaaca 180

acatctccct catggcgaca ctgaaggccc ctctgagggt ccacatcacc tcactgttgc 240

ccacccccga ggacaacctg gagatcgttc tgcacagatg ggagaacaac agctgtgttg 300

agaagaaggt ccttggagag aagactggga atccaaagaa gttcaagatc aactatacgg 360

tggcgaacga ggccacgctg ctcgatactg actacgacaa tttcctgttt ctctgcctac 420

aggacaccac cacccccatc cagagcatga tgtgccagta cctggccaga gtcctggtgg 480

aggacgatga gatcatgcag ggattcatca gggctttcag gcccctgccc aggcacctat 540

ggtacttgct ggacttgaaa cagatggaag agccgtgccg tttctagctc acctccgcct 600

ccaggaagac cagactccca cccttccaca cctccagagc agtgggactt cctcctgccc 660

tttcaaagaa taaccacagc tcagaagacg atgacgtggt catctgtgtc gccatccccc 720

tcctgctgca cacctgcacc attgccatgg ggaggctgct ccctgggggc agagtctctg 780

gcagaggtta ttaataaacc cttggagcat g 811

<210> 39
<211> 1480
<212> DNA
<213> Homo sapiens

<400> 39
ctctgcaaaa ttcagctgct gcctctgtct tgaggacccc agcgcctttc ccccggggcc 60

atgctgcctg cagccacagc ctccctcctg gggcccctcc tcactgcctg cgccctgctg 120

ccttttgccc agggccagac ccccaactac accagacccg tgttcctgtg cggaggggat 180

gtgaaggggg aatcaggtta cgtggcaagt gaggggttcc ccaactccta ccccccctaat 240

aaggagtgca tctggaccat aacggtcccc gagggccaga ctgtgtccct ctcattccga 300

gtcttcgacc tggagctgca ccccgcctgc cgctacgatg ctctggaggt cttcgctggg 360

tctgggactt ccggccagcg gctcggacgc ttttgtggga ccttccggcc tgcgccccta 420

gtcgcccccg gcaaccaggt gaccctgagg atgacgacgg atgagggcac aggaggacga 480

ggcttcctgc tctggtacag cgggcgggcc acctcgggct ctgagcacca attttgcggg 540

gggcggctgg agaaggccca gggaaccctg accacgccca actggcccga gtccgattac 600

cccccgggca tcagctgttc ctggcacatc atcgcgcccc cggaccaggt catcgcgctg 660

accttcgaga agtttgacct ggagccggac acctactgcc gctatgactc ggtcagcgtc 720

ttcaacggag ccgtgagcga cgactcccgg aggctgggga agttctgcgg cgacgcagtc 780

ccgggctcca tctcctccga agggaatgaa ctcctcgtcc agttcgtctc agatctcagt 840

gtcaccgctg atggcttctc agcctcctac aagaccctgc cgcggggcac tgccaaagaa 900

gggcaagggc ccggccccaa acggggaact gagcctaaag tcaagctgcc ccccaagtcc 960

caacctccgg agaaaacaga ggaatctcct tcagcccctg atgcacccac ctgcccaaag 1020

cagtgccgcc ggacaggcac cttgcagagc aacttctgtg ccagcagcct tgtggtgact 1080

gcgacagtga agtccatggt tcgggagcca ggggagggcc ttgccgtgac tgtcagtctt 1140

attggtgctt ataaaactgg aggactggac ctgccaactc cacccactgg tgcctccctg 1200

aagttttacg tgccttgcaa gcagtgcccc cccatgaaga aaggagtcag ttatctgctg 1260

atgggccagg tagaagagaa cagaggcccc gtccttcctc cagagagctt tgtggttctc 1320

caccggccca accaggacca gatcctcacc aacctaagca agaggaagtg cccctctcaa 1380

cctgtgcggg ctgctgcgtc ccaggactga gacgcaggcc agccccggcc cctagccctc 1440

aggcctctct tcttatccaa ataaatgttt cttaatgaaa 1480

<210> 40
<211> 6378
<212> DNA
<213> Homo sapiens

<400> 40
cccattactg ttggagctac agggagagaa acaggaggag actgcaagag atcatttggg 60

aaggccgtgg gcacgctctt tactccatgt gtgggacatt cattgcggaa taacatcgga 120

ggagaagttt cccagagcta tggggacttc ccatccggcg ttcctggtct taggctgtct 180

tctcacaggg ctgagcctaa tcctctgcca gctttcatta ccctctatcc ttccaaatga 240

aaatgaaaag gttgtgcagc tgaattcatc cttttctctg agatgctttg gggagagtga 300

agtgagctgg cagtacccca tgtctgaaga agagagctcc gatgtggaaa tcagaaatga 360

agaaaacaac agcggccttt ttgtgacggt cttggaagtg agcagtgcct cggcggccca 420

cacagggttg tacacttgct attacaacca cactcagaca gaagagaatg agcttgaagg 480

caggcacatt tacatctatg tgccagaccc agatgtagcc tttgtacctc taggaatgac 540

ggattattta gtcatcgtgg aggatgatga ttctgccatt ataccttgtc gcacaactga 600

tcccgagact cctgtaacct tacacaacag tgagggggtg gtacctgcct cctacgacag 660

cagacagggc tttaatggga ccttcactgt agggccctat atctgtgagg ccaccgtcaa 720

aggaaagaag ttccagacca tcccatttaa tgtttatgct ttaaaagcaa catcagagct 780

ggatctagaa atggaagctc ttaaaaccgt gtataagtca ggggaaacga ttgtggtcac 840

ctgtgctgtt tttaacaatg aggtggttga ccttcaatgg acttaccctg gagaagtgaa 900

aggcaaaggc atcacaatgc tggaagaaat caaagtccca tccatcaaat tggtgtacac 960

tttgacggtc cccgaggcca cggtgaaaga cagtggagat tacgaatgtg ctgcccgcca 1020

ggctaccagg gaggtcaaag aaatgaagaa agtcactatt tctgtccatg agaaaggttt 1080

cattgaaatc aaacccacct tcagccagtt ggaagctgtc aacctgcatg aagtcaaaca 1140

ttttgttgta gaggtgcggg cctacccacc tcccaggata tcctggctga aaaacaatct 1200

gactctgatt gaaaatctca ctgagatcac cactgatgtg gaaaagattc aggaaataag 1260

gtatcgaagc aaattaaagc tgatccgtgc taaggaagaa gacagtggcc attatactat 1320

tgtagctcaa aatgaagatg ctgtgaagag ctatactttt gaactgttaa ctcaagttcc 1380

ttcatccatt ctggacttgg tcgatgatca ccatggctca actgggggac agacggtgag 1440

gtgcacagct gaaggcacgc cgcttcctga tattgagtgg atgatatgca aagatattaa 1500

gaaatgtaat aatgaaactt cctggactat tttggccaac aatgtctcaa acatcatcac 1560

ggagatccac tcccgagaca ggagtaccgt ggagggccgt gtgactttcg ccaaagtgga 1620

ggagaccatc gccgtgcgat gcctggctaa gaatctcctt ggagctgaga accgagagct 1680

gaagctggtg gctcccaccc tgcgttctga actcacggtg gctgctgcag tcctggtgct 1740

gttggtgatt gtgatcatct cacttattgt cctggttgtc atttggaaac agaaaccgag 1800

gtatgaaatt cgctggaggg tcattgaatc aatcagcccg gatggacatg aatatattta 1860

tgtggacccg atgcagctgc cttatgactc aagatgggag tttccaagag atggactagt 1920

gcttggtcgg gtcttggggt ctggagcgtt tgggaaggtg gttgaaggaa cagcctatgg 1980

attaagccgg tcccaacctg tcatgaaagt tgcagtgaag atgctaaaac ccacggccag 2040

atccagtgaa aaacaagctc tcatgtctga actgaagata atgactcacc tggggccaca 2100

tttgaacatt gtaaacttgc tgggagcctg caccaagtca ggccccattt acatcatcac 2160

agagtattgc ttctatggag atttggtcaa ctatttgcat aagaataggg atagcttcct 2220

gagccaccac ccagagaagc caaagaaaga gctggatatc tttggattga accctgctga 2280

tgaaagcaca cggagctatg ttatttttatc ttttgaaaac aatggtgact acatggacat 2340

gaagcaggct gatactacac agtatgtccc catgctagaa aggaaagagg tttctaaata 2400

ttccgacatc cagagatcac tctatgatcg tccagcctca tataagaaga aatctatgtt 2460

agactcagaa gtcaaaaacc tcctttcaga tgataactca gaaggcctta ctttattgga 2520

tttgttgagc ttcacctatc aagttgcccg aggaatggag tttttggctt caaaaaattg 2580

tgtccaccgt gatctggctg ctcgcaacgt cctcctggca caaggaaaaa ttgtgaagat 2640

ctgtgacttt ggcctggcca gagacatcat gcatgattcg aactatgtgt cgaaaggcag 2700

tacctttctg cccgtgaagt ggatggctcc tgagagcatc tttgacaacc tctacaccac 2760

actgagtgat gtctggtctt atggcattct gctctgggag atcttttccc ttggtggcac 2820

cccttacccc ggcatgatgg tggattctac tttctacaat aagatcaaga gtgggtaccg 2880

gatggccaag cctgaccacg ctaccagtga agtctacgag atcatggtga aatgctggaa 2940

cagtgagccg gagaagagac cctcctttta ccacctgagt gagattgtgg agaatctgct 3000

gcctggacaa tataaaaaga gttatgaaaa aattcacctg gacttcctga agagtgacca 3060

tcctgctgtg gcacgcatgc gtgtggactc agacaatgca tacattggtg tcacctacaa 3120

aaacgaggaa gacaagctga aggactggga gggtggtctg gatgagcaga gactgagcgc 3180

tgacagtggc tacatcattc ctctgcctga cattgaccct gtccctgagg aggaggacct 3240

gggcaagagg aacagacaca gctcgcagac ctctgaagag agtgccattg agacgggttc 3300

cagcagttcc accttcatca agagagagga cgagaccatt gaagacatcg acatgatgga 3360

cgacatcggc atagactctt cagacctggt ggaagacagc ttcctgtaac tggcggattc 3420

gaggggttcc ttccacttct ggggccacct ctggatcccg ttcagaaaac cactttattg 3480

caatgcggag gttgagagga ggacttggtt gatgtttaaa gagaagttcc cagccaaggg 3540

cctcggggag cgttctaaat atgaatgaat gggatatttt gaaatgaact ttgtcagtgt 3600

tgcctctcgc aatgcctcag tagcatctca gtggtgtgtg aagtttggag atagatggat 3660

aagggaataa taggccacag aaggtgaact ttgtgcttca aggacattgg tgagagtcca 3720

acagacacaa tttatactgc gacagaactt cagcattgta attatgtaaa taactctaac 3780

caaggctgtg tttagattgt attaactatc ttctttggac ttctgaagag accactcaat 3840

ccatccatgt acttccctct tgaaacctga tgtcagctgc tgttgaactt tttaaagaag 3900

tgcatgaaaa accatttttg aaccttaaaa ggtactggta ctatagcatt ttgctatctt 3960

ttttagtgtt aagagataaa gaataataat taaccaacct tgtttaatag atttgggtca 4020

tttagaagcc tgacaactca ttttcatatt gtaatctatg tttataatac tactactgtt 4080

atcagtaatg ctaaatgtgt aataatgtaa catgatttcc ctccagagaa agcacaattt 4140

aaaacaatcc ttactaagta ggtgatgagt ttgacagttt ttgacattta tattaaataa 4200

catgtttctc tataaagtat ggtaatagct ttagtgaatt aaatttagtt gagcatagag 4260

aacaaagtaa aagtagtgtt gtccaggaag tcagaatttt taactgtact gaataggttc 4320

cccaatccat cgtattaaaa aacaattaac tgccctctga aataatggga ttagaaacaa 4380

acaaaactct taagtcctaa aagttctcaa tgtagaggca taaacctgtg ctgaacataa 4440

cttctcatgt atattaccca atggaaaata taatgatcag caaaaagact ggatttgcag 4500

aagtttttt ttttttctt catgcctgat gaaagctttg gcaaccccaa tatatgtatt 4560

ttttgaatct atgaacctga aaagggtcag aaggatgccc agacatcagc ctccttcttt 4620

caccccttac cccaaagaga aagagtttga aactcgagac cataaagata ttctttagtg 4680

gaggctggat gtgcattagc ctggatcctc agttctcaaa tgtgtgtggc agccaggatg 4740

actagatcct gggtttccat ccttgagatt ctgaagtatg aagtctgagg gaaaccagag 4800

tctgtatttt tctaaactcc ctggctgttc tgatcggcca gttttcggaa acactgactt 4860

aggtttcagg aagttgccat gggaaacaaa taatttgaac tttggaacag ggttggaatt 4920

caaccacgca ggaagcctac tatttaaatc cttggcttca ggttagtgac atttaatgcc 4980

atctagctag caattgcgac cttaatttaa ctttccagtc ttagctgagg ctgagaaagc 5040

taaagtttgg ttttgacagg ttttccaaaa gtaaagatgc tacttcccac tgtatggggg 5100

agattgaact ttccccgtct cccgtcttct gcctcccact ccataccccg ccaaggaaag 5160

gcatgtacaa aaattatgca attcagtgtt ccaagtctct gtgtaaccag ctcagtgttt 5220

tggtggaaaa aacattttaa gttttactga taatttgagg ttagatggga ggatgaattg 5280

tcacatctat ccacactgtc aaacaggttg gtgtgggttc attggcattc tttgcaatac 5340

tgcttaattg ctgataccat atgaatgaaa catgggctgt gattactgca atcactgtgc 5400

tatcggcaga tgatgctttg gaagatgcag aagcaataat aaagtacttg actacctact 5460

ggtgtaatct caatgcaagc cccaactttc ttatccaact ttttcatagt aagtgcgaag 5520

actgagccag attggccaat taaaaacgaa aacctgacta ggttctgtag agccaattag 5580

acttgaaata cgtttgtgtt tctagaatca cagctcaagc attctgttta tcgctcactc 5640

tcccttgtac agccttattt tgttggtgct ttgcattttg atattgctgt gagccttgca 5700

tgacatcatg aggccggatg aaacttctca gtccagcagt ttccagtcct aacaaatgct 5760

cccacctgaa tttgtatatg actgcatttg tgggtgtgtg tgtgttttca gcaaattcca 5820

gatttgtttc cttttggcct cctgcaaagt ctccagaaga aaatttgcca atctttccta 5880

ctttctattt ttatgatgac aatcaaagcc ggcctgagaa acactatttg tgacttttta 5940

aacgattagt gatgtcctta aaatgtggtc tgccaatctg tacaaaatgg tcctattttt 6000

gtgaagaggg acataagata aaatgatgtt atacatcaat atgtatatat gtatttctat 6060

atagacttgg agaatactgc caaaacattt atgacaagct gtatcactgc cttcgtttat 6120

atttttttaa ctgtgataat ccccacaggc acattaactg ttgcactttt gaatgtccaa 6180

aatttatatt ttagaaataa taaaaagaaa gatacttaca tgttcccaaa acaatggtgt 6240

ggtgaatgtg tgagaaaaac taacttgata gggtctacca atacaaaatg tattacgaat 6300

gcccctgttc atgtttttgt tttaaaacgt gtaaatgaag atctttatat ttcaataaat 6360

gatatataat ttaaagtt 6378

<210> 41
<211> 2075
<212> DNA
<213> Homo sapiens

<400> 41
gggaatgtaa gatggcggag tagcaacgca aagcgcttgg tattgagtct gtggccgact 60

tcggttccgg tctctgcagc agccgtgatc gcttagtgga gtgcttaggg tagttggcca 120

ggatgccgaa tatcaaaatc ttcagcggca gctcccacca ggacttatct cagaaaattg 180

ctgaccgcct gggcctggag ctaggcaagg tggtgactaa gaaattcagc aaccaggaga 240

cctgtgtgga aattggtgaa agtgtacgtg gagaggatgt ctacattgtt cagagtggtt 300

gtggcgaaat caatgacaat ttaatggagc ttttgatcat gattaatgcc tgcaagattg 360

cttcagccag ccgggttact gcagtcatcc catgcttccc ttatgcccgg caggataaga 420

aagataagag ccgggcgcca atctcagcca agcttgttgc aaatatgcta tctgtagcag 480

gtgcagatca tattatcacc atggacctac atgcttctca aattcagggc ttttttgata 540

tcccagtaga caatttgtat gcagagccgg ctgtcctaaa gtggataagg gagaatatct 600

ctgagtggag gaactgcact attgtctcac ctgatgctgg tggagctaag agagtgacct 660

ccattgcaga caggctgaat gtggactttg ccttgattca caaagaacgg aagaaggcca 720

atgaagtgga ccgcatggtg cttgtgggag atgtgaagga tcgggtggcc atccttgtgg 780

atgacatggc tgacacttgt ggcacaatct gccatgcagc tgacaaactt ctctcagctg 840

gcgccaccag agtttatgcc atcttgactc atggaatctt ctccggtcct gctatttctc 900

gcatcaacaa cgcatgcttt gaggcagtag tagtcaccaa taccatacct caggaggaca 960

agatgaagca ttgctccaaa atacaggtga ttgacatctc tatgatcctt gcagaagcca 1020

tcaggagaac tcacaatgga gaatccgttt cttacctatt cagccatgtc cctttataat 1080

agagtaactt ctgaggcttt ttgagaataa aatccacccc acccttgttt ccccttggta 1140

tttgatgaca aattcagcag aagacccggc ttgctccagt gtagctttct acatcccaca 1200

tcaggtatat tagagcttat ccgaactggg gaaagacgga ttgagattaa ctgctgggac 1260

ctcctacctg cattatctca ttctggcttc cttgataatt ctgtgggcct tgcagcttta 1320

actatagctc agctgctgca agatttcaga cttttgagga tgttgtgtga gggtgtttga 1380

ctgtgactgg ggaagctcag actactttgt atgtgaatgc ttcagggttt tctttgttga 1440

gaacaactag caacaaaggc aacccatgtg tgaccagttc tccccaaggt ctatgctaaa 1500

ttatagcaag agccctgggc aaccccaaac ctagtcctgg tagctgagca ccctgtaagg 1560

caggagcagg cagctcagct tgagcagaca ttgggtgggg ggtgggggggt ggttgagggg 1620

ggaggcagca cagtgcagca aatgtttctt gggaggaaga agcctgatcc atcaccatct 1680

gcttgactat gtagcttgga ttctcctttg tacctatccc tttcgatttg gctttacctt 1740

catctatctt gatcctttcc tggccaaata tcctcttggg cccaaatgaa cattgtacca 1800

tagtcttctg gaaagcaaac atgcttcctg ctatgtaatt gctaacattc atattagatg 1860

atgtgctgta gcttgatctt ccttagccta ctgccactga ggcagtaggt tttaggtggt 1920

atcgtagtgc cttttgatta atttaagtat ttaattttca tcttccttct ttggatctat 1980

ttggcctctc aaatgaactg agattcctgt taaaaaagat tgatgttatt gtctcttgta 2040

gaggaaacta ataaagtgtg tgtacctgtg tgaat 2075

<210> 42
<211> 2457
<212> DNA
<213> Homo sapiens

<400> 42
cgctgttgcc tccgccacct cctccgccgc cgcgcgcccc tcggagttcc gcgccccacc 60

atgcccaaca tcgtgctgtt cagcggcagc tcgcatcagg acctatccca gcgcgtggcc 120

gaccgcctgg gcctggagct gggcaaggtg gtcacgaaga agttcagcaa ccaggagacc 180

agcgtggaga ttggtgaaag cgtgagaggg gaagatgtct acatcatcca gagcggctgc 240

ggggaaatta acgacaacct gatggaactc ctcatcatga tcaatgcctg caagattgcg 300

tcatcatcca gagtaactgc cgtgatcccg tgtttcccat acgcccgaca agataaaaag 360

gacaagagtc gtgccccaat ttctgcaaaa cttgtggcca atatgctgtc ggtggctggg 420

gcggatcaca tcatcaccat ggacctgcat gcttctcaga tacagggatt ctttgatatt 480

cctgtggata atttgtatgc ggagcccgca gtcctgcagt ggattcggga aaacattgcc 540

gagtggaaga actgtatcat tgtttcacct gacgcagggg gagccaaaag ggttacatca 600

attgcagaca ggttgaatgt ggaatttgct ttgatccaca aagagaggaa gaaggcgaat 660

gaagtggacc ggatggtcct ggtgggcgac gtgaaggacc gtgtggccat cctcgtggat 720

gacatggctg acacttgcgg caccatctgc catgctgcgg acaagctgct gtcagctgga 780

gccaccaaag tgtatgctat ccttacccat gggatcttct ctggaccagc tatttccaga 840

ataaataatg ccgcctttga ggctgttgtc gtcacaaaca caattccgca agaggacaaa 900

atgaaacact gcaccaagat tcaggtcatt gacatttcca tgatcttggc cgaagcaatc 960

cgaaggacac acaatgggga atccgtgtcc tacctgttca gccatgtccc gctataaatc 1020

cagaatggga agtgtccagc aagcctactc tgacttctga cttgtttttg ttttctggat 1080

ttttagctgt aggtattcag caatgatagg ttaatcactg gcaaaagcat cagatctttg 1140

tatatgctaa gatttattgt ttccccttct aaagctcaag atcatttctt tccagttttt 1200

ggggaaatgg tggtggttat ttggtcttta agtgaactgt cttaaatgag aaacgttttt 1260

gtcattttga cttttaacag gtacaggtga tctcttcctt tgttctttca gtactttgag 1320

gcgacaactt tcaagtatat aatttcattg tggaagtcat agtttatata tttcgaggtt 1380

gccaaaggtg acttcacatt aaagccttct gtgtaaatat atactgataa tgcctatgga 1440

catttgggta aaaccctgta tagaattaat tatcctttta ctttggagtg aaccttggaa 1500

aatttataat tataatacca tggattttga attttccttt ttttttttct tttttggata 1560

actcagtttc agataaacca tcttggttac tgtgcttaat ttggaccaaa ttttatttag 1620

cttaatatgg acactgacac attttggggg gtatacatta gacatatcag agcagtgtat 1680

ttctggatca ttttttaaat gacctcttct aaaacataac tgtcacttac ctgaaatgct 1740

gcatcctaaa attccaaaat tatattgagc aatcgccaag gcctaaagcc aactgactta 1800

aaggtaatca tttcagctaa gattaaattt aaagcctaag aatgtataga gctagtttta 1860

aaataatgat ctcagatttt taaaaaggat ataggaacct gcattgtcat tctctgaatt 1920

aagaactgat ggtttctatc attatttagc cccacctttg tattttaaaa tccttcagaa 1980

tacatttatg aaccaatgcg actggactta gccacacaca atggaaattc agaccttgac 2040

tatttggtgt ttccagttca caaaggtgat gaagactgtc ttgggagcag cttaatccca 2100

aaatttgtac atttcttgct gctcctggcg tggaaactta agtgagacca ccaaatacat 2160

tggtcctgtc caattctact gaatgggggt ggacctggca tttatctggc caaaaacagg 2220

agccagagaa atatgaatat accaaagttg tttgtttagc ctccaactta aattacatta 2280

gtcaacttat agatactcat atgatcactt ttctttttag atactacatc aactagattc 2340

aggagtatat catttgcagt gcttgtattg gtttaaaatg taagatttta agatcctcta 2400

acactgtact aaaacatttc aataaaatca ttctgactgc gttcaaaaaa aaaaaaa 2457

<210> 43
<211> 1550
<212> DNA
<213> Homo sapiens

<400> 43
gtggcctacc atggtttcaa cgggtaacgg ggaataaggg ttcgattcgg agctgcggga 60

gccgggctgg caggagcagg atggcggcgg cggcggctgc aggcgaggcg cgccgggtgc 120

tggtgtacgg cggcaggggc gctctgggtt ctcgatgcgt gcaggctttt cgggcccgca 180

actggtgggt tgccagcgtt gatgtggtgg agaatgaaga ggccagcgct acgatcattg 240

ttaaaatgac agactcgttc actgagcagg ctgaccaggt gactgctgag gttggaaagc 300

tcttgggtga agagaaggtg gatgcaattc tttgcgttgc tggaggatgg gccgggggca 360

atgccaaatc caagtctctc tttaagaact gtgacctgat gtggaagcag agcatatgga 420

catcgaccat ctccagccat ctggctacca agcatctcaa ggaaggaggc ctcctgacct 480

tggctggcgc aaaggctgcc ctggatggga ctcctggtat gatcgggtac ggcatggcca 540

agggtgctgt tcaccagctc tgccagagcc tggctgggaa gaacagcggc atgccgcccg 600

gggcagccgc catcgctgtg ctcccggtta ccctggatac cccgatgaac aggaaatcaa 660

tgcctgaggc tgacttcagc tcctggacac ccttagaatt cctagttgaa actttccatg 720

actggatcac agggaaaaac cgaccgagct caggaagcct aatccaggtg gtaaccacag 780

aaggaaggac ggaactcacc ccagcatatt tttaggcctc atctcagtgc ctatgagggg 840

cctgccagaa aagtcactaa cctgtctcag tgtggccttg tccagccttg tgttttctgt 900

aacccctgtt tgtggtacga gataatgagt cctatttttc tctcacataa tatgcatttg 960

ctctcctagg gacaagtgta atacatttat gtgaagtaag acaatgcgag actggtggcc 1020

gtcaaatagc atccgtcaat ctgtgttaac tgcataggag gctctcgata gcacctgcta 1080

tagcggtgtc atgttggatc gctttgtgac tgttcatctg tccttgacag tggctgtcat 1140

cttgactact ttgttgattt gttggtattg gggacatttt aaaggctgag ttatttttga 1200

atgtcatgtt tatgtcatag acgtagaaaa cgcatccttg aattaaactg ccttaactcc 1260

ttttgtggta taagcaaact acatggactc tgtccctggt atccttttcc tgtgtggttg 1320

cccctgtgcc tgtggtctgg cctaggttaa gtgtgcaaga taactactcg tgagttattc 1380

agaatgttgt tcctaataaa tgcacttgtt gtctgtcttc tttaatcaaa tcacatctta 1440

tatacagcag tcagagatga gtatactaga atcatggatt gctggaggtc ttttaatctg 1500

atgttctcag aaggggggtgg atttaaatcc tgaaataaat atttcaacac 1550

<210> 44
<211> 1179
<212> DNA
<213> Homo sapiens

<400> 44
gaattcggca cgaggcggtt agacatgggc actccacaga aggatgttat tatcaagtca 60

gatgcaccgg acactttgtt attggagaaa catgcagatt atatcgcatc ctatggctca 120

aagaaagatg attatgaata ctgtatgtct gagtatttga gaatgagtgg catctattgg 180

ggtctgacag taatggatct catgggacaa cttcatcgca tgaatagaga agagattctg 240

gcatttatta agtcttgcca acatgaatgt ggtggaataa gtgctagtat cggacatgat 300

cctcatcttt tatacactct tagtgctgtc cagattctta cgctgtatga cagtattaat 360

gttattgacg taaataaagt tgtggaatat gttaaaggtc tacagaaaga agatggttct 420

tttgctggag atatttgggg agaaattgac acaagattct ctttttgtgc ggtggcaact 480

ttggctttgt tggggaagct tgatgctatt aatgtggaaa aggcaatcga atttgtttta 540

tcctgtatga actttgacgg tggatttggt tgcagaccag gttctgaatc ccatgctggg 600

cagatctatt gttgcacagg atttctggct attacaagtc agttgcatca agtaaattct 660

gatttacttg gctggtggct ttgtgaacga caattaccct caggcgggct caatggaagg 720

ccggagaagt taccagatgt atgctactca tggtgggtcc tggcttccct aaagataatt 780

ggaagacttc attggattga tagagagaaa ctgcgtaatt tcattttagc atgtcaagat 840

gaagaaacgg ggggatttgc agacaggcca ggagatatgg tggatccttt tcatacctta 900

tttggaattg ctggattgtc acttttggga gaagaacaga ttaaacctgt taatcctgtc 960

ttttgcatgc ctgaagaagt gcttcagaga gtgaatgttc agcctgagct agtgagctag 1020

attcattgaa ttgaaagttg catagtatag ttttgccatt ttaacatttc tgtatttgaa 1080

gtgcttatcg aatctaaaag tgactactgt taatattttg tatattgtgt taaattaatt 1140

ttaataaatt atataattat gcatattgta aaataaaaa 1179

<210> 45
<211> 3524
<212> DNA
<213> Homo sapiens

<400> 45
tctccgtcag ccgcattgcc cgctcggcgt ccggcccccg acccgtgctc gtccgcccgc 60

ccgcccgccc gcccgcgcca tgaacgccaa ggtcgtggtc gtgctggtcc tcgtgctgac 120

cgcgctctgc ctcagcgacg ggaagcccgt cagcctgagc tacagatgcc catgccgatt 180

cttcgaaagc catgttgcca gagccaacgt caagcatctc aaaattctca acactccaaa 240

ctgtgccctt cagattgtag cccggctgaa gaacaacaac agacaagtgt gcattgaccc 300

gaagctaaag tggattcagg agtacctgga gaaagcttta aacaagaggt tcaagatgtg 360

agagggtcag acgcctgagg aacccttaca gtaggagccc agctctgaaa ccagtgttag 420

ggaagggcct gccacagcct cccctgccag ggcagggccc caggcattgc caagggcttt 480

gttttgcaca ctttgccata ttttcaccat ttgattatgt agcaaaatac atgacattta 540

tttttcattt agtttgatta ttcagtgtca ctggcgacac gtagcagctt agactaaggc 600

cattattgta cttgccttat tagagtgtct ttccacggag ccactcctct gactcagggc 660

tcctgggttt tgtattctct gagctgtgca ggtggggaga ctgggctgag ggagcctggc 720

cccatggtca gccctagggt ggagagccac caagagggac gcctgggggt gccaggacca 780

gtcaacctgg gcaaagccta gtgaaggctt ctctctgtgg gatgggatgg tggagggcca 840

catgggaggc tcacccccct ctccatccac atgggagccg ggtctgcctc ttctgggagg 900

gcagcagggc taccctgagc tgaggcagca gtgtgaggcc agggcagagt gagacccagc 960

cctcatcccg agcacctcca catcctccac gttctgctca tcattctctg tctcatccat 1020

catcatgtgt gtccacgact gtctccatgg ccccgcaaaa ggactctcag gaccaaagct 1080

ttcatgtaaa ctgtgcacca agcaggaaat gaaaatgtct tgtgttacct gaaaacactg 1140

tgcacatctg tgtcttgtgt ggaatattgt ccattgtcca atcctatgtt tttgttcaaa 1200

gccagcgtcc tcctctgtga ccaatgtctt gatgcatgca ctgttccccc tgtgcagccg 1260

ctgagcgagg agatgctcct tgggcccttt gagtgcagtc ctgatcagag ccgtggtcct 1320

ttggggtgaa ctaccttggt tcccccactg atcacaaaaa catggtgggt ccatgggcag 1380

agcccaaggg aattcggtgt gcaccagggt tgaccccaga ggattgctgc cccatcagtg 1440

ctccctcaca tgtcagtacc ttcaaactag ggccaagccc agcactgctt gaggaaaaca 1500

agcattcaca acttgttttt ggtttttaaa acccagtcca caaaataacc aatcctggac 1560

atgaagattc tttcccaatt cacatctaac ctcatcttct tcaccatttg gcaatgccat 1620

catctcctgc cttcctcctg ggccctctct gctctgcgtg tcacctgtgc ttcgggccct 1680

tcccacagga catttctcta agagaacaat gtgctatgtg aagagtaagt caacctgcct 1740

gacatttgga gtgttccccc cccactgagg gcagtcgata gagctgtatt aagccactta 1800

aaatgttcac ttttgacaaa ggcaagcact tgtgggtttt tgttttgttt ttcattcagt 1860

cttacgaata cttttgccct ttgattaaag actccagtta aaaaaaattt taatgaagaa 1920

agtggaaaac aaggaagtca aagcaaggaa actatgtaac atgtaggaag taggaagtaa 1980

attatagtga tgtaatcttg aattgtaact gttcgtgaat ttaataatct gtagggtaat 2040

tagtaacatg tgttaagtat tttcataagt atttcaaatt ggagcttcat ggcagaaggc 2100

aaacccatca acaaaaattg tcccttaaac aaaaattaaa atcctcaatc cagctatgtt 2160

atattgaaaa aatagagcct gagggatctt tactagttat aaagatacag aactctttca 2220

aaacctttg aaattaacct ctcactatac cagtataatt gagttttcag tggggcagtc 2280

attatccagg taatccaaga tattttaaaa tctgtcacgt agaacttgga tgtacctgcc 2340

cccaatccat gaaccaagac cattgaattc ttggttgagg aaacaaacat gaccctaaat 2400

cttgactaca gtcaggaaag gaatcatttc tatttctcct ccatgggaga aaatagataa 2460

gagtagaaac tgcagggaaa attatttgca taacaattcc tctactaaca atcagctcct 2520

tcctggagac tgcccagcta aagcaatatg catttaaata cagtcttcca tttgcaaggg 2580

aaaagtctct tgtaatccga atctcttttt gctttcgaac tgctagtcaa gtgcgtccac 2640

gagctgttta ctagggatcc ctcatctgtc cctccgggac ctggtgctgc ctctacctga 2700

cactcccttg ggctccctgt aacctcttca gaggccctcg ctgccagctc tgtatcagga 2760

cccagaggaa ggggccagag gctcgttgac tggctgtgtg ttgggattga gtctgtgcca 2820

cgtgtatgtg ctgtggtgtg tccccctctg tccaggcact gagataccag cgaggaggct 2880

ccagagggca ctctgcttgt tattagagat tacctcctga gaaaaaagct tccgcttgga 2940

gcagaggggc tgaatagcag aaggttgcac ctcccccaac cttagatgtt ctaagtcttt 3000

ccattggatc tcattggacc cttccatggt gtgatcgtct gactggtgtt atcaccgtgg 3060

gctccctgac tgggagttga tcgcctttcc caggtgctac acccttttcc agctggatga 3120

gaatttgagt gctctgatcc ctctacagag cttccctgac tcattctgaa ggagccccat 3180

tcctgggaaa tattccctag aaacttccaa atcccctaag cagaccactg ataaaaccat 3240

gtagaaaatt tgttattttg caacctcgct ggactctcag tctctgagca gtgaatgatt 3300

cagtgttaaa tgtgatgaat actgtatttt gtattgtttc aagtgcatct cccagataat 3360

gtgaaaatgg tccaggagaa ggccaattcc tatacgcagc gtgctttaaa aaataaataa 3420

gaaacaactc tttgagaaac aacaatttct actttgaagt cataccaatg aaaaaatgta 3480

tatgcactta taattttcct aataaagttc tgtactcaaa tgta 3524

<210> 46
<211> 2038
<212> DNA
<213> Homo sapiens

<400> 46

gcaggcccgt tggaagtggt tgtgacaacc ccagcaatgt ggagaagcct ggggcttgcc 60

ctggctctct gtctcctccc atcgggagga acagagagcc aggaccaaag ctccttatgt 120

aagcaacccc cagcctggag cataagagat caagatccaa tgctaaactc caatggttca 180

gtgactgtgg ttgctcttct tcaagccagc tgatacctgt gcatcatcga ggcatctaaa 240

ttagaagacc tgcgagtaaa actgaagaaa gaaggatatt ctaatatttc ttatattgtt 300

gttaatcatc aaggaatctc ttctcgatta aaatacacac atcttaagaa taaggtttca 360

gagcatattc ctgtttatca acaagaagaa aaccaaacag atgtctggac tcttttaaat 420

ggaagcaaag atgacttcct catatatgat agatgtggcc gtcttgtata tcatcttggt 480

ttgccttttt ccttcctaac tttcccatat gtagaagaag ccattaagat tgcttactgt 540

gaaaagaaat gtggaaactg ctctctcacg actctcaaag atgaagactt ttgtaaacgt 600

gtatctttgg ctactgtgga taaaacagtt gaaactccat cgcctcatta ccatcatgag 660

catcatcaca atcatggaca tcagcacctt ggcagcagtg agctttcaga gaatcagcaa 720

ccaggagcac caaatgctcc tactcatcct gctcctccag gccttcatca ccaccataag 780

cacaagggtc agcataggca gggtcaccca gagaaccgag atatgccagc aagtgaagat 840

ttacaagatt tacaaaagaa gctctgtcga aagagatgta taaatcaatt actctgtaaa 900

ttgcccacag attcagagtt ggctcctagg agctgatgct gccattgtcg acatctgata 960

tttgaaaaaa cagggtctgc aatcacctga cagtgtaaag aaaacctccc atctttatgt 1020

agctgacagg gacttcgggc agaggagaac ataactgaat cttgtcagtg acgtttgcct 1080

ccagctgcct gacaaataag tcagcagctt atacccacag aagccagtgc cagttgacgc 1140

tgaaagaatc aggcaaaaaa gtgagaatga ccttcaaact aaatatttaa aataggacat 1200

actccccaat ttagtctaga cacaatttca tttccagcat ttttataaac taccaaatta 1260

gtgaaccaaa aatagaaatt agatttgtgc aaacatggag aaatctactg aattggcttc 1320

cagattttaa attttatgtc atagaaatat tgactcaaac catatttttt atgatggagc 1380

aactgaaagg tgattgcagc ttttggttaa tatgtctttt ttttttcttt tccagtgttc 1440

tatttgcttt aatgagaata gaaacgtaaa ctatgaccta ggggtttttct gttggataat 1500

tagcagttta gaatggagga agaacaacaa agacatgctt tccatttttt cctttactta 1560

tctctcaaaa caatattact ttgtcttttc aatcttctac ttttaactaa taaaataagt 1620

ggattttgta ttttaagatc cagaaatact taacacgtga atattttgct aaaaaagcat 1680

atataactat tttaaatatc catttatctt ttgtatatct aagactcatc ctgattttta 1740

ctatcacaca tgaataaagg cctttgtatc tttctttctc taatgttgta tcatactctt 1800

ctaaaacttg agtggctgtc ttaaaagata taaggggaaa gataatattg tctgtctcta 1860

tattgcttag taagtatttc catagtcaat gatggtttaa taggtaaacc aaaccctata 1920

aacctgacct cctttatggt taatactatt aagcaagaat gcagtacaga attggataca 1980

gtacggattt gtccaaataa attcaataaa aaccttaaaa aaaaaaaaaa aaaaaaaa 2038

<210> 47
<211> 2588
<212> DNA
<213> Homo sapiens

<400> 47
gaattcgccg gtccagcctc ctctgggagc gggcagttgg cgaccctgca ctgacccgcg 60

tccctccgtc ccgagcccgc gcgccctcag agggtgcccg gacagactga agccatggcg 120

attctttttg ctgttgttgc caggggggacc actatccttg ccaaacatgc ttggtgtgga 180

ggaaacttcc tggaggtgac agagcagatt ctggctaaga taccttctga aaataacaaa 240

ctaacgtact cacatggcaa ttatttgttt cattacatct gccaagacag gattgtatat 300

ctttgtatca ctgatgatga ttttgaacgt tcccgagcct ttaattttct gaatgagata 360

aagaagaggt tccagactac ttacggttca agagcacaga cagcacttcc atatgccatg 420

aatagcgagt tctcaagtgt cttagctgca cagctgaagc atcactctga gaataagggc 480

ctagacaaag tgatggagac tcaagcccaa gtggatgaac tgaaaggaat catggtcaga 540

aacatagatc tggtagctca gcgaggagaa agattggaat tattgattga caaaacagaa 600

aatcttgtgg attcttctgt caccttcaaa actaccagca gaaatcttgc tcgagccatg 660

tgtatgaaga acctcaagct cactattatc atcatcatcg tatcaattgt gttcatctat 720

atcattgttt cacctctctg tggtggattt acatggccaa gctgtgtgaa gaaataggaa 780

agaagaagtt accattaacc aaggatatga gagaacaagg agttaaaagc aatccatgtg 840

actcaagcct ttcacatact gacagatggt atctgccagt ctcttcaacc ctcttctcac 900

tttttaaaat cttgttccat gcctccaggt ttatctttgt cttatctacc agtttattcc 960

tgtgaacttc agattgaacc attcattgca gcagtagcct taaaaaggct tttgtttatt 1020

tctttggttt gttaactagt gtcatctatt tagagaaaca tttttgtttt taattgctca 1080

aagctgtcgc cgctagtctt atgagctatc tactaaaact atggagaaac tttgtatgtg 1140

cacacaaaag tattcaagag acagtattgc taacatctca tcttaatgtc ttttgttatt 1200

gagaagtttt aggtgcttca aaacaatata aatggataat agttgttatt tggggaattg 1260

taatgatgtt ggtgctgctt ccttctaaga gctcagacaa gtaaagtatg aaacattctt 1320

atttcagtta gatggggaac attttgctag cccattagaa gcacacagaa ttatccttgt 1380

cctcctaata ttgactttca ggaataaagt tcagtgtgct gatcattcac aatacagtgg 1440

atagcttgat atcttctgtt ttcccattgc agttgatttg agaagatgaa ggtttaaata 1500

ttgttgaaag ttgcagtttt ttaaatgtgt tccttttttct tctgtgaata tttagggcaa 1560

tcgtgtcgct aatagaatat gtagtagagg gggtggggag gtaaattcct ctgacttgcc 1620

aaagaaaaag aagggaacca cagtggatat gctagcattt tagctgtgca aagggaggta 1680

gtgtgggaaa agtgtttcca ttctgggaaa agcccaaacc gaatacggtc agcagtcaac 1740

tccagggttt gggcttgatt cctgttgaat aatagttttg agcattcttt gtggttaaat 1800

aaattcttaa atctgcctag ttttgatgaa ttcttttgtg aaacttgaaa gagaatagac 1860

agtatgacat atagaattaa tacaaaacag tttaacaacc atttaactgc agtgtaagaa 1920

aattggactg taatcatatc gctactggca tctgttatct agtatgcatt tctggtgtgt 1980

atctgaaagg aagacatttt ctaccctaga tccaattgca tttatttatc aataagtgcc 2040

attaaattga aattatatta cattttacac tttctcaatg aatgaacaaa ttagtctgta 2100

gaatctagcc acctgtttag cctagtcatg tgccttgaac atatatgtgt cccataatct 2160

ggctcatggt acctgttctt ctatccaaac ctttcaattc atgctacctg attcatttat 2220

ttgacataga tcttaggccc acttgaactc ttttcttgtt tatctagcat agcacaaacg 2280

tttttccagt cttctttatc aacactaatg cctcttaatt gcatcagtat ttcctattgg 2340

aaaatacatc tgttccagaa aaacatttgg cattcctgaa taatttccaa atgtttttaa 2400

tccaaagaaa aaggtttaaa gcttatttcc ctttcttata cacacctgaa taaaattgat 2460

gtgcatgttt tagggatcaa ttacctaact gttccttggt ctatttatgt ataagaatgc 2520

tttttaaagc acatgtctca ttttaaatga cgcacaaact gaagatgtta ataaaattta 2580

aggaattc 2588

<210> 48
<211> 7888
<212> DNA
<213> Homo sapiens

<400> 48
tccgggtatg gatgtcaatc ttttgtctac aatgtgaata catttatcct tcggggacca 60

tcaagacttt caggaaaggc cccgcctgtc tctgcgcggc cactttgctg ggacaaaggt 120

caactgaaga agtgggcagg cccgaggcag gagagatgct gaggagtcca tgtgcagggg 180

agggaaaggg agaggcagtc agggagagga ggaggaggta ccgccagaag gggatcctcc 240

cgctccgaaa accagacacc gggtcttgcc ctgtggtcca ggcaggagtg cagtggtgca 300

acctcagctc actgcagcct tgacctcccc gggctcaagc gatcctccgg ccacagcact 360

tggctgttca gcggctggag gagcagggcc ccaggtcctc cccaccctca cctgctgctc 420

ccaggtcgtg gccgtcttgc tcttccaggt ccttctctag ggatgcaata ttcacattgc 480

taagatgcag gtctaacgca gaacctgtca acagagcccc ccatcatcca cagcccaccc 540

agcgctgcag agctcaggaa gcctagctga ggaggacgac cgtcccacct gggcttagag 600

tgagaccaag ggcagaaggc gtgggagttg ctggggcagc cagggaagga caccccagc 660

ccgtcctcgc agccccccac aggcagtggg aggcttggct gttcctccgg caaaacgggc 720

atgctcagtg ggccgggccg gcaggtttgc gtggccgctg agttgccggc gccggctgag 780

ccagcggacg ccgcgttcct tggcggccgc cggttcccgg gaagttacgt ggcgaagccg 840

gcttccgagg agacgccggg aggccacggg tgctgctgac gggcgggcga ccgggcgagg 900

ccgacgtggc cgggctgcga aagctgcggg aggccgagtg ggtgaccgcg ctcggaggga 960

ggtgccggtc gggcgcgccc cgtggagaag acccgggcgg ggcgggcgct tcccggactt 1020

ttgtccgagt tgaattccct ccccctgggc cgggcccttc cgtccgcccc cgcccgtgcc 1080

ccgctcgctc tcgggagatg tttatttggg ctgtggcgtg aggagcgggc gggccagcgc 1140

cgcggagttt cgggtccgag gagcctcgcg cggcgctgga gagagacaag atgtccgcca 1200

gagctgcggc cgccaagagc acagcaatgg aggaaacagc tatatgggaa caacatacag 1260

tgacgcttca cagggctcct ggatttggat ttggaattgc aatatctggt ggacgagata 1320

atcctcattt tcagagtggg gaaacgtcaa tagtgatttc agatgtgctg aaaggaggac 1380

cagctgaagg acagctacag gaaaatgacc gagttgcaat ggttaacgga gtttcaatgg 1440

ataatgttga acatgctttt gctgttcagc aactaaggaa aagtgggaaa aatgcaaaaa 1500

ttacaattag aaggaagaag aaagttcaaa taccagtaag tcgtcctgat cctgaaccag 1560

tatctgataa tgaagaagat agttatgatg aggaaataca tgatccaaga agtggccgga 1620

gtggtgtggt taacagaagg agtgagaaga tttggccgag ggatagaagt gcaagtagag 1680

agaggagctt gtccccgcgg tcagacaggc ggtcagtggc ttccagccag cctgctaaac 1740

ctactaaagt cacactggtg aaatcccgga aaaatgaaga atatggtctt cgattggcaa 1800

gccatatatt tgttaaggaa atttcacaag atagtttggc agcaagagat ggcaatattc 1860

aagaaggtga tgttgtattg aagataaatg gtactgtgac agaaaatatg tcattgacag 1920

atgcaaagac attgatagaa aggtctaaag gcaaattaaa aatggtagtt caaagagatg 1980

aacgggctac gctattgaat gtccctgatc tttctgacag catccactct gctaatgcct 2040

ctgagagaga cgacatttca gaaattcagt cactggcatc agatcattct ggtcgatcac 2100

acgataggcc tccccgccgc agccggtcac gatctcctga ccagcggtca gagccttctg 2160

atcattccag gcactcgccg cagcagccaa gcaatggcag tctccggagt agagatgaag 2220

agagaatttc taaacctggg gctgtctcaa ctcctgtaaa gcatgctgat gatcacacac 2280

ctaaaacagt ggaagaagtt acagttgaaa gaaatgagaa acaaacacct tctcttccag 2340

aaccaaagcc tgtgtatgcc caagttggca accagatgtg gatttacctg tcagtccatc 2400

tgatggtgtc ctacctaatt caactcatga agatgggatt tcttcggccc agcatgaaat 2460

tggtaaaatt cagaaaagga gatagtgtgg gtttgcggct ggctggtgga aatgatgttg 2520

gaatatttgt agctggcgtt ctagaagata gccctgcagc caaggaaggc ttagaggaag 2580

gtgatcaaat tctcagggta aacaacgtag attttacaaa tatcataaga gaagaagccg 2640

tccttttcct gcttgacctc cctaaaggag aagaagtgac catattggct cagaagaaga 2700

aggatgttta tcgtcgcatt gtagaatcag atgtaggaga ttctttctat attagaaccc 2760

attttgaata tgaaaaggaa tctccctatg gacttagttt taacaaagga gaggtgttcc 2820

gtgctgtgga taccttgtac aatggaaaac tgggctcttg gcttgctatt cgaattggta 2880

aaaatcataa ggaggtagaa cgaggcatca tccctaataa gaacagagct gagcagctag 2940

ccagtgtaca gtatacactt ccaaaaacag caggcggaga ccgtgctgac ttctggagat 3000

tcagaggtct tcgcagctcc aagagaaatc ttcgaaaaag cagagaggat ttgtccgctc 3060

agcctgttca aacaaagttt ccagcttatg aaagagtggt tcttcgagaa gctggatttc 3120

tgaggcctgt aaccattttt ggaccaatag ctgatgttgc cagagaaaag ctggcaagag 3180

aagaaccaga tatttatcaa attgcaaaga gtgaaccacg agacgctgga actgaccaac 3240

gtagctctgg ctatattcgc ctgcatacaa taaagcaaat catagatcaa gacaaacatg 3300

ctttattaga tgtaacacca aatgcagttg atcgtcttaa ctatgcccag tggtatccaa 3360

ttgttgtatt tcttaaccct gattctaagc aaggagtaaa aacaatgaga atgaggttat 3420

gtccagaatc tcggaaaagt gccaggaagt tatacgagcg atctcataaa cttgctaaaa 3480

ataatcacca tctttttaca actacaatta acttaaattc aatgaatgat ggttggtatg 3540

gtgcgctgaa agaagcagtt caacaacagc aaaaccagct ggtatgggtt tccgagggaa 3600

aggcggatgg tgctacaagt gatgaccttg atttgcatga tgatcgtctg tcctacctgt 3660

cagctccagg tagtgaatac tcaatgtata gcacggacag tagacacact tctgactatg 3720

aagacacaga cacagaaggc ggggcctaca ctgatcaaga actagatgaa actcttaatg 3780

atgaggttgg gactccaccg gagtctgcca ttacacggtc ctctgagcct gtaagagagg 3840

actcctctgg aatgcatcat gaaaaccaaa catatcctcc ttactcacca caagcgcagc 3900

cacaaccaat tcatagaata gactcccctg gatttaagcc agcctctcaa cagaaagcag 3960

aagcttcatc tccagtccct tacctttcgc ctgaaacaaa cccagcatca tcaacctctg 4020

ctgttaatca taatgtaaat ttaactaatg tcagactgga ggagcccacc ccagctcctt 4080

ccacctctta ctcaccacaa gctgattctt taagaacacc aagtactgag gcagctcaca 4140

taatgctaag agatcaagaa ccatcattgt cgtcgcatgt agatccaaca aaggtgtata 4200

gaaaggatcc atatcccgag gaaatgatga ggcagaacca tgttttgaaa cagccagccg 4260

ttagtcaccc agggcacagg ccagacaaag agcctaatct gacctatgaa ccccaactcc 4320

catacgtaga gaaacaagcc agcagagacc tcgagcagcc cacatacaga tacgagtcct 4380

caagctatac ggaccagttt tctcgaaact atgaacatcg tctgcgatac gaagatcgcg 4440

tccccatgta tgaagaacag tggtcatatt atgatgacaa acagccctac ccatctcggc 4500

caccttttga taatcagcac tctcaagacc ttgactccag acagcatccc gaagagtcct 4560

cagaacgagg gtactttcca cgttttgaag agccagcccc tctgtcttac gacagcagac 4620

cacgttacga acaggcacct agagcatccg ccctgcggca cgaagagcag ccagctcctg 4680

ggtatgacac acatggtaga ctcagaccgg aagcccagcc ccacccttca gcagggccca 4740

agcctgcaga gtccaagcag tattttgagc aatattcacg cagttacgag caagtaccac 4800

cccaaggatt tacctctaga gcaggtcatt ttgagcctct ccatggtgct gcagctgtcc 4860

ctccgctgat accttcatct cagcataagc cagaagctct gccttcaaac accaaaccac 4920

tgcctccacc cccaactcaa accgaagaag aggaagatcc agcaatgaag ccacagtctg 4980

tactcaccag agttaagatg tttgaaaaca aaagatctgc atccttagag accaagaagg 5040

atgtaaatga cactggcagt tttaagcctc cagaagtagc atctaaacct tcaggtgctc 5100

ccatcattgg tcccaaaccc acttctcaga atcaattcag tgaacatgac aaaactctgt 5160

acaggatccc agaacctcaa aaacctcaac tgaagccacc tgaagatatt gttcggtcca 5220

atcattatga ccctgaagaa gatgaagaat attatcgaaa acagctgtca tactttgacc 5280

gaagaagttt tgagaataag cctcctgcac acattgctgc cagccatctc tccgagcctg 5340

caaagccagc tcattctcag aatcaatcaa atttttctag ttattcttca aagggaaagc 5400

ctcctgaagc tgatggtgtg gatagatcat ttggcgagaa acgctatgaa cccatccagg 5460

ccactccccc tcctcctcca ttgccctcgc agtatgccca gccatctcag cctgtcacca 5520

gcgcgtctct ccacatacat tctaagggag cacatggtga aggtaattca gtgtcattgg 5580

attttcagaa ttccttagtg tccaaaccag acccacctcc atctcagaat aagccagcaa 5640

ctttcagacc accaaaccga gaagatactg ctcaggcagc tttctatccc cagaaaagtt 5700

ttccagataa agccccagtt aatggaactg aacagactca gaaaacagtc actccagcat 5760

acaatcgatt cacaccaaaa ccatatacaa gttctgcccg accatttgaa cgcaagtttg 5820

aaagtcctaa attcaatcac aatcttctgc caagtgaaac tgcacataaa cctgacttgt 5880

cttcaaaaac tcccacttct ccaaaaactc ttgtgaaatc gcacagtttg gcacagcctc 5940

ctgagtttga cagtggagtt gaaactttct ctatccatgc agagaagcct aaatatcaaa 6000

taaataatat cagcacagtg cctaaagcta ttcctgtgag tccttcagct gtggaagagg 6060

atgaagatga agatggtcat actgtggtgg ccacagcccg aggcatattt aacagcaatg 6120

ggggcgtgct gagttccata gaaactggtg ttagtataat tatccctcaa ggagccattc 6180

ccgaaggagt tgagcaggaa atctatttca aggtctgccg ggacaacagc atccttccac 6240

ctttagataa agagaaaggt gaaacactgc tgagtccttt ggtgatgtgt ggtccccatg 6300

gcctcaagtt cctgaagcct gtggagctgc gcttaccaca ctgtgatcct aaaacctggc 6360

aaaacaagtg tcttcccgga gatccaaatt atctcgttgg agcaaactgt gtttctgtcc 6420

ttattgacca cttttaactc ttgaaatata ggaacttaaa taatgtgaaa ctggattaaa 6480

cttaatctaa atggaaccac tctatcaagt attatacctt ttttagagtt gatactacag 6540

tttgttagta tgaggcattt gtttgaactg ataaagatga gtgagcatgc ccctgaacca 6600

tggtcggaaa acatgctaca cactgcatgt ttgtgattga cgggactgtt ggtattggct 6660

agaggttcaa agatattttg ctttgtgatt tttgtaattt ttttatcgtc actgcttaac 6720

ttcacatatt gatttccgtt aaaataccag ccagtaaatg ggggtgcatt tgaggtctgt 6780

tctttccaaa gtacactgtt tcaaacttta ctatggccct ggcctagcat acgtacacat 6840

tttattttat tatgcatgaa gtaatatgca cacatttttt aaatgcacct ggaatatata 6900

accagtgttg tggatttaac agaaatgtac agcaaggaga tttacaactg ggggagggtg 6960

aagtgaagac aatgacttac tgtacatgaa aacacatttt tcttagggaa ggatacaaaa 7020

gcatgtgaga ctggttccat ggcctcttca gatctctaac ttcaccatat taccacagac 7080

atactaacca gcagaaatgc cttaccctca tgttcttaat tcttagctca ttctccttgt 7140

gttactaagt ttttatggct tttgtgcatt atctagatac tgtatcatga caaagactga 7200

gtacgttgtg catttggtgg tttcagaaat gtgttatcac ccagaagaaa atagtggtgt 7260

gatttgggga tatttttttc ttttcttttc ttttcttttt ttttttttt tgacaagggg 7320

cagtggtggt tttctgttct ttctggctat gcatttgaaa attttgatgt tttaaggatg 7380

cttgtacata atgcgtgcat accacttttg ttcttggttt gtaaattaac ttttataaac 7440

tttacctttt ttatacataa acaagaccac gtttctaaag gctacctttg tattctctcc 7500

tgtacctctt gagccttgaa ctttgacctc tgcagcaata aagcagcgtt tctatgacac 7560

atgcaaggtc attttttta agaaaaagga tgcacagagt tgttacattt ttaagtgctg 7620

catttaaaag atacagttac tcagaattct ctagtttgat taaattcttg caaagtatcc 7680

ctactgtaat ttgtgataca atgctgtgcc ctaaagtgta ttttttact aatagacaat 7740

ttattatgac acatcagcac gatttctgtt taaataatac accactacat tctgttaatc 7800

attaggtgtg actgaatttc ttttgccgtt attaaaaatc tcaaatttct aaatctccaa 7860

aataaaactt tttaaaataa aaaaaaat 7888

<210> 49
<211> 5503
<212> DNA
<213> Homo sapiens

<220>
<221> Unsure
<222> (2083)..(2083)
<223> n = a, c, g or t/u

<400> 49
ggtgcgctca ggactggaag caactctcag ttcatcaatt tcatgggcct acgtatctgc 60

tctggccacg gcctggcctc catccccact gtggcattaa tgcagaacaa attgagacat 120

atcctctata taattagttc cagaatttaa aaagatttac ggtataataa tagaggcagt 180

gccgcggaat cctttcactg aggactctcg gggagctcgg ggaccatctc gcggtggcat 240

cagaacagac gagtaacccc agcggctcca ggcactgcga actgggggag agggggaaat 300

tttgcaccgc attcggcagt acctaacggt tccgggctcc cagatagggt cagcgaggag 360

agttaggaca gtaagtgggg actggttaaa aaaaatcgac ttaattttga aatgatcaga 420

agaagctggg agtagttatc acaaagcccc tcccttgccc ccccctttt ttaattgaag 480

gaatgacgtt gaaattttca ccgccagcgc ggggctggga accatcctaa acacttgccc 540

tgcagccccg agtgggcaga ttccgaagag ttggagtcgg cggggagggg aggaacagct 600

gttgggctgt cttgcgcgtg gggctcgggg cgcgggcccc ggggagaggc gctagtcgaa 660

agcttgttcc tctcccgcga caggcagcag cgaggtcgag ccactcttta ttacggcctg 720

cgggccccgc gcgcagtgtg gctgtccccg cccttgaccg accgcagcgc tttggggtgt 780

ttattcagtt gtccgcggcc gctgggtgac tcccggaggc ggcccaggcg tgcgcactgg 840

tccctggggt tgcggctgta gcagcccagc tccgcgctct gtcagatgca gtggacagcg 900

ccggggtgaa agtaagggtt gagaaatcct cactgccctg ctcctaccca gcctcgattt 960

tttcatattg caataattat gcaccttcga ggccgggatg cctgcgcttt gccagtgtat 1020

caacgccaca tggttttcca ggggctgtcc tcgcctctgc atcccattag ctctgaagag 1080

gtagaggggt ggtgggtaaa acctccaact ggacgttgag agacccgggt ttcagctcgg 1140

cgttgccact aacttgtttc ctgtccttaa acagtagtag taacaaaaac tgtaaagttg 1200

attgagtcaa aggcccacac tgctctccta tctaatcctc agaacaactc tatgaggtgg 1260

gcgctagtat cccattatcc cgtttgacca gtaaggaaac tgaggctcag agagactgcg 1320

gaactcgtct agggtcacac agctgttggt tacctggcag agctgaggtt ccattctggg 1380

gccaccaacc ccttgctctt tacgtgcgct ccatagactg cctctccttc ggctgtctgg 1440

gcctcagttt ccttctctgt aaaacgagaa gtttaatctg cagctttctt tgccaatcgg 1500

tggttcagac caggaacctc tgctacagat ctcggcgctg acaggggtaa gaaggtgggt 1560

gaaagaaggg ggcgcccagt tttccacagc ctgcttttct ctgggacctc gcgaagggcg 1620

ggcctcgcga gctaaaggag gtacaggaga gcgcctatcg tccgcggcgg gtgaaggtgc 1680

tacctgcctt cgtgctaggc tgtgagtcct ggtgcttagc tcagggcgcc aaggccagtg 1740

tagctggcat gtccccctttg gaaaacctca ggtctcccgc agagaacgtt acccacaaca 1800

aagaagagga cagagaggca tggagcgccc tgcgactgca ggagtacgtc agttccccag 1860

cgctggctta gtgtcgcctg ggcttccggg catgtggatc cgttggggtc gtacggagac 1920

ttcctgtcgg gtccctgggg tcctccgact gcggctcctc agcttagcac tttcttcttg 1980

gccccgcagg ctgcagggaa ctcctcccac ctctttagtc ggagaagtcc aagtcgggcg 2040

agggggcacc ccggggttcg caccggtgct cttcccctcc ccnccccccac aaggattctg 2100

agaaaataaa tggcagagga gagaggagtt ctacatttgc ttggctctcc tttcctccta 2160

tccacccctа catccctcac cccggnncaa aaacttattt ttgaaaaatg ttggcagaga 2220

tttacgtgtc tttgccttac ctgggtttca caaacacaac gactcacatt caagccagcc 2280

tcccttcaga taacctcctc tccccccgct aaaagtgcca aggatggtaa aagaagaaac 2340

aatctcaatc ttttcgtttg gaaatgaaag tccccggctt ttcataaagg gctcctcgcc 2400

cctcacagtt gagtcctagt taagaaaaac gacttccaag tagaaataat aggcggggag 2460

aaggaaggga gatacaggga tctggggngt tcttagggca actggcagtg aattttgtct 2520

cgagagtcct ttctccactc aaaaaaccaa acgcgcgagc cccgcgaaag gtttagggat 2580

agatcgtgtg ggagaggact gagcagagag cgtgggggca gtgtcttgta gaatctttct 2640

tttcttaata ataattttaa aagcttctga gtggagacga cgcaaagtca agcagcaaag 2700

gtggcctggg aggcaagcgg agggctcaag tgccgcatct ttaccctcag ggtctcctgc 2760

gcctacggga tgcgcattcc caagaagtgc gcccttcgag taagtcctgg gcccgcacac 2820

acttcgggtc cgcagccaga atttaatggc gacaacgttt atgcaatgca agctaaaaac 2880

caaagcgtaa aaaattacta tgtcatttat tgaaacgcca ttctttgtca aactgcaact 2940

actttgcttc acataagttt ggctggaaag cttgcagccc cagcccgggc cagccaggta 3000

caggaggccg gactgcaacc ggttgcttcc ctcccgtcgc gcctggccgt cccacgctgc 3060

gccgtcgctg ctgcctcctg gcgcccctgg gattttatac gcacctctga aacacgctcc 3120

gctccggccc ccggttcttc tccttgccta ggggttgttt cccaatagat actgactcct 3180

ttagaagatc caaaaaccaa accaaaacac cccctacccg ccccaaacac ctgctctggg 3240

gcgcgggggc tgccaaacag agactagacg aagggagtca gatttagcga agctcttcga 3300

gctcccaaag attcgaacac taactcgcgc ccgtgggccg atggaggttc tccctactcc 3360

actccttggt ccccttaact ggcttncgcc tcctggtcaa tcactgagca accagaatgg 3420

tatcctcgac cagggccaca ggcagtgctc ggcggagtgg ctccaggagt tacccgctcc 3480

ctgccgggct tcgtatccaa accctcccct tcacccctcc tccccaaact gggcgccagg 3540

atgctccggc cggaatatac gcaggctttg ggcgtttgcc caagggtttt cttccctcct 3600

aaactagccg ctgttttccc ggcttaaccg tagaagaatt agatattcct cactggaaag 3660

ggaaactaag tgctgctgac tccaatttta ggtaggcggc aaccgccttc cgcctggngn 3720

aaacctcacc aagtaaacaa ctactagccg atcgaaatac gcccggctta taactggtgc 3780

aactcccggc cacccaactg agggacgttc gctttcagtc ccgacctctg gaacccacaa 3840

agggccacct ctttccccag tgaccccaag atcatggcca ctcccctacc cgacagttct 3900

agaagcaaga gccagactca agggtgcaaa gcaagggnat acgcttcttt gaagcttgac 3960

tgagttcttt ctgcgctttc ctgaagttcc cgccctcttg gagcctacct gcccctccct 4020

ccaaaccact cttttagatt aacaacccca tctctactcc caccgcattc gaccctgccc 4080

ggactcactg cttacctgaa cgactctcca gtgagacgag gctcccacac tggcgaaggc 4140

caagaagggg aggtgggggg agggttgtgc cacaccggcc agctgagagc gcgtgttggg 4200

ttgaagagga gggtgtctcc gagagggacg ctccctcgga cccgccctca ccccagctgc 4260

gagggcgccc ccaaggagca gcgcgcgctg cctggccggg cttgggctgc tgagtgaatg 4320

gagcggccga gcctcctggc tcctcctctt ccccgcgccg ccggcccctc ttatttgagc 4380

tttgggaagc tgagggcagc caggcagctg gggtaaggag ttcaaggcag cgcccacacc 4440

cgggggctct ccgcaacccg accgcctgtc cgctcccccа cttcccgccc tccctcccac 4500

ctactcattc acccacccac ccacccagag ccgggacggc agcccaggcg cccgggcccc 4560

gccgtctcct cgccgcgatc ctggacttcc tcttgctgca ggacccggct tccacgtgtg 4620

tcccggagcc ggcgtctcag cacacgctcc gctccgggcc tgggtgccta cagcagccag 4680

agcagcaggg agtccgggac ccgggcggca tctgggccaa gttaggcgcc gccgaggcca 4740

gcgctgaacg tctccagggc cggaggagcc gcggggcgtc cgggtctgag cctcagcaaa 4800

tgggctccga cgtgcgggac ctgaacgcgc tgctgcccgc cgtcccctcc ctgggtggcg 4860

gcggcggctg tgccctgcct gtgagcggcg cggcgcagtg ggcgccggtg ctggactttg 4920

cgcccccggg cgcttcggct tacgggtcgt tgggcggccc cgcgccgcca ccggctccgc 4980

cgccaccccc gccgccgccg cctcactcct tcatcaaaca ggagccgagc tggggcggcg 5040

cggagccgca cgaggagcag tgcctgagcg ccttcactgt ccacttttcc ggccagttca 5100

ctggcacagc cggagcctgt cgctacgggc ccttcggtcc tcctccgccc agccaggcgt 5160

catccggcca ggccaggatg tttcctaacg cgccctacct gcccagctgc ctcgagagcc 5220

agcccgctat tcgcaatcag ggtaagtagg ccggggagcg ccccctacgc gcggggcagt 5280

ggcgccaggg actctccgct ctaggacacc cccctctcct acccctttg accgcagctc 5340

ttacccagct gcttcccaag ggccgtgagg atagcggaag cggcggctgg ggaggaggcc 5400

ggagagtggg agtgcacgca ggcactggcc cccgacatcc tccaaagcca ggcagagcta 5460

ggagcctgac tgttcgcaag agccgggagg gcgtctgggg ccc 5503

<210> 50
<211> 1860
<212> DNA
<213> Homo sapiens

<400> 50
gggacgtgag ccgctgcgcc caccgggcta gacccggcgc catcatgctg cttctgccaa 60

gcgccgcgga cggccggggc accgccatca cccacgctct gacctctgcc tctacactct 120

gtcaagttga acctgtggga agatggtttg aagcttttgt taagaggaga aacagaaatg 180

cttctgcctc ttttcaggaa ctggaggata agaaagagtt atccgaggaa tcagaagatg 240

aagaattgca gttggaagag tttcccatgc tgaaaacact tgatcccaaa gactggaaga 300

accaagatca ttatgcagtt cttggacttg gccatgtgag atacaaggct acacagagac 360

agatcaaagc agctcataaa gcaatggttt taaaacatca cccagacaaa cggaaagcag 420

ctggtgaacc aataaaagaa ggagataatg actacttcac ttgcataact aaagcttatg 480

aaatgttatc tgatccagtg aaaagacgag catttaacag tgtagatcct acttttgata 540

actcagttcc ttctaaaagt gaagcaaagg ataatttctt cgaagtgttt accccagtgt 600

ttgaaaggaa ttccagatgg tcaaataaaa aaaatgttcc taaacttggt gatatgaatt 660

catcatttga agatgtagat atattttatt ctttctggta taattttgat tcttggagag 720

aattttctta tttagatgaa gaagaaaaag aaaaagcaga atgtcgtgat gagaggagat 780

ggattgaaaa gcagaacgga gcaacaagag cacaaagaaa aaaagaagaa atgaacagaa 840

taagaacatt agttgacaat gcatacagct gtgatccaag gataaaaaag ttcaaggaag 900

aagaaaaagc caagaaagaa gcagaaaaga aagcaaaagc agaagctaaa cggaaggagc 960

aagaagctaa agaaaaacaa agacaagctg aattagaagc tgctcggtta gctaaggaga 1020

aagaagagga ggaagtcaga cagcaagcat tgctggcaaa gaaggaaaaa gatatccaga 1080

aaaaagccat taagaaggaa aggcaaaaac ttcgaaactc atgcaagata gaagaaataa 1140

atgagcaaat cagaaaagag aaagaggaag ctgaggctcg tatgcgacaa gcatctaaga 1200

acacagagaa atcaactggt ggaggtggaa atggaagtaa aaattggtca gaagatgatc 1260

tacaattact aattaaagct gtgaatctgt tccctgctag aacaaattca agatgggaag 1320

ttattgctaa ttacatgaac atacattctt cctctggagt caaaagaact gccaaagatg 1380

ttattggcaa agcaaagagt ctccaaaaac ttgaccctca tcaaaaagat gacataaata 1440

aaaaggcatt tgataagttc aaaaaagaac atggagtggt acctcaagca gacaacgcaa 1500

cgccttcaga acgatttgaa ggtccatata cagacttcac cccttggaca acagaagaac 1560

agaagctttt ggaacaagct ttgaaaacat acccagtaaa tacacctgaa agatgggaaa 1620

aaatagcaga agcggtgcct ggcaggacaa agaaggactg catgaaacga tacaaggaac 1680

ttgtcgagat ggtaaaagca aagaaagctg ctcaagaaca agtgctgaat gcaagtagag 1740

ccaagaaatg acaatctttg ttgtgtgtgc atttttataa taaaactgaa aatactgtaa 1800

acattttcat tcttaaaatt atactcatgg taataatttg aaagtaaaaa aaaaaaaaaa 1860

<210> 51
<211> 729
<212> PRT
<213> Homo sapiens

<400> 51

Met His Leu Lys Ile Val Leu Ala Phe Leu Ala Leu Ser Leu Ile Thr
1 5 10 15

Ile Phe Ala Leu Ala Tyr Val Leu Leu Thr Ser Pro Gly Gly Ser Ser
20 25 30

Gln Pro Pro His Cys Pro Ser Val Ser His Arg Ala Gln Pro Trp Pro
35 40 45

His Pro Gly Gln Ser Gln Leu Phe Ala Asp Leu Ser Arg Glu Glu Leu
50 55 60

```
Thr Ala Val Met Arg Phe Leu Thr Gln Arg Leu Gly Pro Gly Leu Val
65                  70                  75                  80

Asp Ala Ala Gln Ala Gln Pro Ser Asp Asn Cys Ile Phe Ser Val Glu
                85                  90                  95

Leu Gln Leu Pro Pro Lys Ala Ala Ala Leu Ala His Leu Asp Arg Gly
            100                 105                 110

Ser Pro Pro Pro Ala Arg Glu Ala Leu Ala Ile Val Leu Phe Gly Gly
        115                 120                 125

Gln Pro Gln Pro Asn Val Ser Glu Leu Val Val Gly Pro Leu Pro His
    130                 135                 140

Pro Ser Tyr Met Arg Asp Val Thr Val Glu Arg His Gly Gly Pro Leu
145                 150                 155                 160

Pro Tyr His Arg Arg Pro Val Leu Arg Ala Glu Phe Thr Gln Met Trp
                165                 170                 175

Arg His Leu Lys Asp Val Glu Leu Pro Lys Ala Pro Ile Phe Leu Ser
            180                 185                 190

Ser Thr Phe Asn Tyr Asn Gly Ser Thr Leu Ala Ala Val His Ala Thr
        195                 200                 205

Pro Arg Gly Leu Arg Ser Arg Glu Arg Thr Thr Trp Ile Gly Leu Tyr
    210                 215                 220

His Asn Ile Ser Gly Val Gly Leu Phe Leu His Pro Val Gly Leu Glu
225                 230                 235                 240

Leu Leu Leu Asp His Arg Ala Leu Asp Pro Ala His Trp Thr Val Gln
                245                 250                 255

Gln Val Phe Tyr Leu Gly His Tyr Tyr Ala Asp Leu Gly Gln Leu Glu
            260                 265                 270

Arg Glu Phe Lys Ser Gly Arg Leu Glu Val Val Arg Val Pro Leu Pro
        275                 280                 285

Pro Pro Asn Gly Ala Ser Ser Leu Arg Ser Arg Asn Ser Pro Gly Pro
    290                 295                 300

Leu Pro Pro Leu Gln Phe Ser Pro Gln Gly Ser Gln Tyr Ser Val Gln
305                 310                 315                 320

Gly Asn Leu Val Val Ser Ser Leu Trp Ser Phe Thr Phe Gly His Gly
                325                 330                 335

Val Phe Ser Gly Leu Arg Ile Phe Asp Val Arg Phe Gln Gly Glu Arg
            340                 345                 350

Ile Ala Tyr Glu Val Ser Val Gln Glu Cys Val Ser Ile Tyr Gly Ala
        355                 360                 365

Asp Ser Pro Lys Thr Met Leu Thr Arg Tyr Leu Asp Ser Ser Phe Gly
    370                 375                 380
```

```
Leu Gly Arg Asn Ser Arg Gly Leu Val Arg Gly Val Asp Cys Pro Tyr
385                 390                 395                 400

Gln Ala Thr Met Val Asp Ile His Ile Leu Val Gly Lys Gly Ala Val
                405                 410                 415

Gln Leu Leu Pro Gly Ala Val Cys Val Phe Glu Glu Ala Gln Gly Leu
            420                 425                 430

Pro Leu Arg Arg His His Asn Tyr Leu Gln Asn His Phe Tyr Gly Gly
        435                 440                 445

Leu Ala Ser Ser Ala Leu Val Val Arg Ser Val Ser Ser Val Gly Asn
    450                 455                 460

Tyr Asp Tyr Ile Trp Asp Phe Val Leu Tyr Pro Asn Gly Ala Leu Glu
465                 470                 475                 480

Gly Arg Val His Ala Thr Gly Tyr Ile Asn Thr Ala Phe Leu Lys Gly
                485                 490                 495

Gly Glu Glu Gly Leu Leu Phe Gly Asn Arg Val Gly Glu Arg Val Leu
            500                 505                 510

Gly Thr Val His Thr His Ala Phe His Phe Lys Leu Asp Leu Asp Val
        515                 520                 525

Ala Gly Leu Lys Asn Trp Val Val Ala Glu Asp Val Val Phe Lys Pro
    530                 535                 540

Val Ala Ala Pro Trp Asn Pro Glu His Trp Leu Gln Arg Pro Gln Leu
545                 550                 555                 560

Thr Arg Gln Val Leu Gly Lys Glu Asp Leu Thr Ala Phe Ser Leu Gly
                565                 570                 575

Ser Pro Leu Pro Arg Tyr Leu Tyr Leu Ala Ser Asn Gln Thr Asn Ala
            580                 585                 590

Trp Gly His Gln Arg Gly Tyr Gln Leu Val Val Thr Gln Arg Lys Glu
        595                 600                 605

Glu Glu Ser Gln Ser Ser Ser Ile Tyr His Gln Asn Asp Ile Trp Thr
    610                 615                 620

Pro Thr Val Thr Phe Ala Asp Phe Ile Asn Asn Glu Thr Leu Leu Gly
625                 630                 635                 640

Glu Asp Leu Val Ala Trp Val Thr Ala Ser Phe Leu His Ile Pro His
                645                 650                 655

Ala Glu Asp Ile Pro Asn Thr Val Thr Leu Gly Asn Arg Val Gly Phe
            660                 665                 670

Leu Leu Arg Pro Tyr Asn Phe Phe Asp Glu Asp Pro Ser Ile Phe Ser
        675                 680                 685

Pro Gly Ser Val Tyr Phe Glu Lys Gly Gln Asp Ala Gly Leu Cys Ser
    690                 695                 700
```

Ile Asn Pro Val Ala Cys Leu Pro Asp Leu Ala Ala Cys Val Pro Asp
705 710 715 720

Leu Pro Pro Phe Ser Tyr His Gly Phe
725

<210> 52
<211> 885
<212> PRT
<213> Homo sapiens

<400> 52

Met Ala Trp Arg Cys Pro Arg Met Gly Arg Val Pro Leu Ala Trp Cys
1 5 10 15

Leu Ala Leu Cys Gly Trp Ala Cys Met Ala Pro Arg Gly Thr Gln Ala
20 25 30

Glu Glu Ser Pro Phe Val Gly Asn Pro Gly Asn Ile Thr Gly Ala Arg
35 40 45

Gly Leu Thr Gly Thr Leu Arg Cys Gln Leu Gln Val Gln Gly Glu Pro
50 55 60

Pro Glu Val His Trp Leu Arg Asp Gly Gln Ile Leu Glu Leu Ala Asp
65 70 75 80

Ser Thr Gln Thr Gln Val Pro Leu Gly Glu Asp Glu Gln Asp Asp Trp
85 90 95

Ile Val Val Ser Gln Leu Arg Ile Thr Ser Leu Gln Leu Ser Asp Thr
100 105 110

Gly Gln Tyr Gln Cys Leu Val Phe Leu Gly His Gln Thr Phe Val Ser
115 120 125

Gln Pro Gly Tyr Val Gly Leu Glu Gly Leu Pro Tyr Phe Leu Glu Glu
130 135 140

Pro Glu Asp Arg Thr Val Ala Ala Asn Thr Pro Phe Asn Leu Ser Cys
145 150 155 160

Gln Ala Gln Gly Pro Pro Glu Pro Val Asp Leu Leu Trp Leu Gln Asp
165 170 175

Ala Val Pro Leu Ala Thr Ala Pro Gly His Gly Pro Gln Arg Ser Leu
180 185 190

His Val Pro Gly Leu Asn Lys Thr Ser Ser Phe Ser Cys Glu Ala His
195 200 205

Asn Ala Lys Gly Val Thr Thr Ser Arg Thr Ala Thr Ile Thr Val Leu
210 215 220

Pro Gln Gln Pro Arg Asn Leu His Leu Val Ser Arg Gln Pro Thr Glu
225 230 235 240

Leu Glu Val Ala Trp Thr Pro Gly Leu Ser Gly Ile Tyr Pro Leu Thr
245 250 255

```
His Cys Thr Leu Gln Ala Val Leu Ser Asp Asp Gly Met Gly Ile Gln
            260                 265                 270

Ala Gly Glu Pro Asp Pro Pro Glu Glu Pro Leu Thr Ser Gln Ala Ser
        275                 280                 285

Val Pro Pro His Gln Leu Arg Leu Gly Ser Leu His Pro His Thr Pro
    290                 295                 300

Tyr His Ile Arg Val Ala Cys Thr Ser Ser Gln Gly Pro Ser Ser Trp
305                 310                 315                 320

Thr His Trp Leu Pro Val Glu Thr Pro Glu Gly Val Pro Leu Gly Pro
                325                 330                 335

Pro Lys Asn Ile Ser Ala Thr Arg Asn Gly Ser Gln Ala Phe Val His
            340                 345                 350

Trp Gln Glu Pro Arg Ala Pro Leu Gln Gly Thr Leu Leu Gly Tyr Arg
        355                 360                 365

Leu Ala Tyr Gln Gly Gln Asp Thr Pro Glu Val Leu Met Asp Ile Gly
    370                 375                 380

Leu Arg Gln Glu Val Thr Leu Glu Leu Gln Gly Asp Gly Ser Val Ser
385                 390                 395                 400

Asn Leu Thr Val Cys Val Ala Ala Tyr Thr Ala Ala Gly Asp Gly Pro
                405                 410                 415

Trp Ser Leu Pro Val Pro Leu Glu Ala Trp Arg Pro Val Lys Glu Pro
            420                 425                 430

Ser Thr Pro Ala Phe Ser Trp Pro Trp Trp Tyr Val Leu Leu Gly Ala
        435                 440                 445

Val Val Ala Ala Ala Cys Val Leu Ile Leu Ala Leu Phe Leu Val His
    450                 455                 460

Arg Arg Lys Lys Glu Thr Arg Tyr Gly Glu Val Phe Glu Pro Thr Val
465                 470                 475                 480

Glu Arg Gly Glu Leu Val Val Arg Tyr Arg Val Arg Lys Ser Tyr Ser
                485                 490                 495

Arg Arg Thr Thr Glu Ala Thr Leu Asn Ser Leu Gly Ile Ser Glu Glu
            500                 505                 510

Leu Lys Glu Lys Leu Arg Asp Val Met Val Asp Arg His Lys Val Ala
        515                 520                 525

Leu Gly Lys Thr Leu Gly Glu Gly Glu Phe Gly Ala Val Met Glu Gly
    530                 535                 540

Gln Leu Asn Gln Asp Asp Ser Ile Leu Lys Val Ala Val Lys Thr Met
545                 550                 555                 560

Lys Ile Ala Ile Cys Thr Arg Ser Glu Leu Glu Asp Phe Leu Ser Glu
                565                 570                 575
```

```
Ala Val Cys Met Lys Glu Phe Asp His Pro Asn Val Met Arg Leu Ile
            580                 585                 590

Gly Val Cys Phe Gln Gly Ser Glu Arg Glu Ser Phe Pro Ala Pro Val
        595                 600                 605

Val Ile Leu Pro Phe Met Lys His Gly Asp Leu His Ser Phe Leu Leu
    610                 615                 620

Tyr Ser Arg Leu Gly Asp Gln Pro Val Tyr Leu Pro Thr Gln Met Leu
625                 630                 635                 640

Val Lys Phe Met Ala Asp Ile Ala Ser Gly Met Glu Tyr Leu Ser Thr
                645                 650                 655

Lys Arg Phe Ile His Arg Asp Leu Ala Ala Arg Asn Cys Met Leu Asn
            660                 665                 670

Glu Asn Met Ser Val Cys Val Ala Asp Phe Gly Leu Ser Lys Lys Ile
        675                 680                 685

Tyr Asn Gly Asp Tyr Tyr Arg Gln Gly Arg Ile Ala Lys Met Pro Val
    690                 695                 700

Lys Trp Ile Ala Ile Glu Ser Leu Ala Asp Arg Val Tyr Thr Ser Lys
705                 710                 715                 720

Ser Asp Val Trp Ser Phe Gly Val Thr Met Trp Glu Ile Ala Thr Arg
                725                 730                 735

Gly Gln Thr Pro Tyr Pro Gly Val Glu Asn Ser Glu Ile Tyr Asp Tyr
            740                 745                 750

Leu Arg Gln Gly Asn Arg Leu Lys Gln Pro Ala Asp Cys Leu Asp Gly
        755                 760                 765

Leu Tyr Ala Leu Met Ser Arg Cys Trp Glu Leu Asn Pro Gln Asp Arg
    770                 775                 780

Pro Ser Phe Thr Glu Leu Arg Glu Asp Leu Glu Asn Thr Leu Lys Ala
785                 790                 795                 800

Leu Pro Pro Ala Gln Glu Pro Asp Glu Ile Leu Tyr Val Asn Met Asp
                805                 810                 815

Glu Gly Gly Gly Tyr Pro Glu Pro Pro Gly Ala Ala Gly Gly Ala Asp
            820                 825                 830

Pro Pro Thr Gln Pro Asp Pro Lys Asp Ser Cys Ser Cys Leu Thr Ala
        835                 840                 845

Ala Glu Val His Pro Ala Gly Arg Tyr Val Leu Cys Pro Ser Thr Thr
    850                 855                 860

Pro Ser Pro Ala Gln Pro Ala Asp Arg Gly Ser Pro Ala Ala Pro Gly
865                 870                 875                 880

Gln Glu Asp Gly Ala
                885
```

<210> 53
<211> 373
<212> PRT
<213> Homo sapiens

<400> 53

Met Leu Leu Gly Leu Ala Ala Met Glu Leu Lys Val Trp Val Asp Gly
1 5 10 15

Ile Gln Arg Val Val Cys Gly Val Ser Glu Gln Thr Thr Cys Gln Glu
20 25 30

Val Val Ile Ala Leu Ala Gln Ala Ile Gly Gln Thr Gly Arg Phe Val
35 40 45

Leu Val Gln Arg Leu Arg Glu Lys Glu Arg Gln Leu Leu Pro Gln Glu
50 55 60

Cys Pro Val Gly Ala Gln Ala Thr Cys Gly Gln Phe Ala Ser Asp Val
65 70 75 80

Gln Phe Val Leu Arg Arg Thr Gly Pro Ser Leu Ala Gly Arg Pro Ser
85 90 95

Ser Asp Ser Cys Pro Pro Pro Glu Arg Cys Leu Ile Arg Ala Ser Leu
100 105 110

Pro Val Lys Pro Arg Ala Ala Leu Gly Cys Glu Pro Arg Lys Thr Leu
115 120 125

Thr Pro Glu Pro Ala Pro Ser Leu Ser Arg Pro Gly Pro Ala Ala Pro
130 135 140

Val Thr Pro Thr Pro Gly Cys Cys Thr Asp Leu Arg Gly Leu Glu Leu
145 150 155 160

Arg Val Gln Arg Asn Ala Glu Glu Leu Gly His Glu Ala Phe Trp Glu
165 170 175

Gln Glu Leu Arg Arg Glu Gln Ala Arg Glu Arg Glu Gly Gln Ala Arg
180 185 190

Leu Gln Ala Leu Ser Ala Ala Thr Ala Glu His Ala Ala Arg Leu Gln
195 200 205

Ala Leu Asp Ala Gln Ala Arg Ala Leu Glu Ala Glu Leu Gln Leu Ala
210 215 220

Ala Glu Ala Pro Gly Pro Pro Ser Pro Met Ala Ser Ala Thr Glu Arg
225 230 235 240

Leu His Gln Asp Leu Ala Val Gln Glu Arg Gln Ser Ala Glu Val Gln
245 250 255

Gly Ser Leu Ala Leu Val Ser Arg Ala Leu Glu Ala Ala Glu Arg Ala
260 265 270

Leu Gln Ala Gln Ala Gln Glu Leu Glu Glu Leu Asn Arg Glu Leu Arg

275 280 285

Gln Cys Asn Leu Gln Gln Phe Ile Gln Gln Thr Gly Ala Ala Leu Pro
290 295 300

Pro Pro Pro Arg Pro Asp Arg Gly Pro Pro Gly Thr Gln Gly Pro Leu
305 310 315 320

Pro Pro Ala Arg Glu Glu Ser Leu Leu Gly Ala Pro Ser Glu Ser His
325 330 335

Ala Gly Ala Gln Pro Arg Pro Arg Gly Gly Pro His Asp Ala Glu Leu
340 345 350

Leu Glu Val Ala Ala Ala Pro Ala Pro Glu Trp Cys Pro Leu Ala Ala
355 360 365

Gln Pro Gln Ala Leu
370

<210> 54
<211> 289
<212> PRT
<213> Homo sapiens

<400> 54

Met Glu Leu Leu Cys His Glu Val Asp Pro Val Arg Arg Ala Val Arg
1 5 10 15

Asp Arg Asn Leu Leu Arg Asp Asp Arg Val Leu Gln Asn Leu Leu Thr
20 25 30

Ile Glu Glu Arg Tyr Leu Pro Gln Cys Ser Tyr Phe Lys Cys Val Gln
35 40 45

Lys Asp Ile Gln Pro Tyr Met Arg Arg Met Val Ala Thr Trp Met Leu
50 55 60

Glu Val Cys Glu Glu Gln Lys Cys Glu Glu Glu Val Phe Pro Leu Ala
65 70 75 80

Met Asn Tyr Leu Asp Arg Phe Leu Ala Gly Val Pro Thr Pro Lys Ser
85 90 95

His Leu Gln Leu Leu Gly Ala Val Cys Met Phe Leu Ala Ser Lys Leu
100 105 110

Lys Glu Thr Ser Pro Leu Thr Ala Glu Lys Leu Cys Ile Tyr Thr Asp
115 120 125

Asn Ser Ile Lys Pro Gln Glu Leu Leu Glu Trp Glu Leu Val Val Leu
130 135 140

Gly Lys Leu Lys Trp Asn Leu Ala Ala Val Thr Pro His Asp Phe Ile
145 150 155 160

Glu His Ile Leu Arg Lys Leu Pro Gln Gln Arg Glu Lys Leu Ser Leu
165 170 175

```
Ile Arg Lys His Ala Gln Thr Phe Ile Ala Leu Cys Ala Thr Asp Phe
            180                 185                 190

Lys Phe Ala Met Tyr Pro Pro Ser Met Ile Ala Thr Gly Ser Val Gly
        195                 200                 205

Ala Ala Ile Cys Gly Leu Gln Gln Asp Glu Glu Val Ser Ser Leu Thr
    210                 215                 220

Cys Asp Ala Leu Thr Glu Leu Leu Ala Lys Ile Thr Asn Thr Asp Val
225                 230                 235                 240

Asp Cys Leu Lys Ala Cys Gln Glu Gln Ile Glu Ala Val Leu Leu Asn
                245                 250                 255

Ser Leu Gln Gln Tyr Arg Gln Asp Gln Arg Asp Gly Ser Lys Ser Glu
            260                 265                 270

Asp Glu Leu Asp Gln Ala Ser Thr Pro Thr Asp Val Arg Asp Ile Asp
        275                 280                 285

Leu
```

<210> 55
<211> 693
<212> PRT
<213> Homo sapiens

<400> 55

```
Met Lys Glu Asn Tyr Cys Leu Gln Ala Ala Leu Val Cys Leu Gly Met
1               5                   10                  15

Leu Cys His Ser His Ala Phe Ala Pro Glu Arg Arg Gly His Leu Arg
            20                  25                  30

Pro Ser Phe His Gly His His Glu Lys Gly Lys Glu Gly Gln Val Leu
        35                  40                  45

Gln Arg Ser Lys Arg Gly Trp Val Trp Asn Gln Phe Phe Val Ile Glu
    50                  55                  60

Glu Tyr Thr Gly Pro Asp Pro Val Leu Val Gly Arg Leu His Ser Asp
65                  70                  75                  80

Ile Asp Ser Gly Asp Gly Asn Ile Lys Tyr Ile Leu Ser Gly Glu Gly
                85                  90                  95

Ala Gly Thr Ile Phe Val Ile Asp Asp Lys Ser Gly Asn Ile His Ala
            100                 105                 110

Thr Lys Thr Leu Asp Arg Glu Glu Arg Ala Gln Tyr Thr Leu Met Ala
        115                 120                 125

Gln Ala Val Asp Arg Asp Thr Asn Arg Pro Leu Glu Pro Pro Ser Glu
    130                 135                 140

Phe Ile Val Lys Val Gln Asp Ile Asn Asp Asn Pro Pro Glu Phe Leu
145                 150                 155                 160
```

```
His Glu Thr Tyr His Ala Asn Val Pro Glu Arg Ser Asn Val Gly Thr
                165                 170                 175

Ser Val Ile Gln Val Thr Ala Ser Asp Ala Asp Asp Pro Thr Tyr Gly
            180                 185                 190

Asn Ser Ala Lys Leu Val Tyr Ser Ile Leu Glu Gly Gln Pro Tyr Phe
        195                 200                 205

Ser Val Glu Ala Gln Thr Gly Ile Ile Arg Thr Ala Leu Pro Asn Met
    210                 215                 220

Asp Arg Glu Ala Lys Glu Glu Tyr His Val Val Ile Gln Ala Lys Asp
225                 230                 235                 240

Met Gly Gly His Met Gly Gly Leu Ser Gly Thr Thr Lys Val Thr Ile
                245                 250                 255

Thr Leu Thr Asp Val Asn Asp Asn Pro Pro Lys Phe Pro Gln Ser Val
            260                 265                 270

Tyr Gln Ile Ser Val Ser Glu Ala Ala Val Pro Gly Glu Glu Val Gly
        275                 280                 285

Arg Val Lys Ala Lys Asp Pro Asp Ile Gly Glu Asn Gly Leu Val Thr
    290                 295                 300

Tyr Asn Ile Val Asp Gly Asp Gly Met Glu Ser Phe Glu Ile Thr Thr
305                 310                 315                 320

Asp Tyr Glu Thr Gln Glu Gly Val Ile Lys Leu Lys Lys Pro Val Asp
                325                 330                 335

Phe Glu Thr Lys Arg Ala Tyr Ser Leu Lys Val Glu Ala Ala Asn Val
            340                 345                 350

His Ile Asp Pro Lys Phe Ile Ser Asn Gly Pro Phe Lys Asp Thr Val
        355                 360                 365

Thr Val Lys Ile Ala Val Glu Asp Ala Asp Glu Pro Pro Met Phe Leu
    370                 375                 380

Ala Pro Ser Tyr Ile His Glu Val Gln Glu Asn Ala Ala Ala Gly Thr
385                 390                 395                 400

Val Val Gly Arg Val His Ala Lys Asp Pro Asp Ala Ala Asn Ser Pro
                405                 410                 415

Ile Arg Tyr Ser Ile Asp Arg His Thr Asp Leu Asp Arg Phe Phe Thr
            420                 425                 430

Ile Asn Pro Glu Asp Gly Phe Ile Lys Thr Thr Lys Pro Leu Asp Arg
        435                 440                 445

Glu Glu Thr Ala Trp Leu Asn Ile Thr Val Phe Ala Ala Glu Ile His
    450                 455                 460

Asn Arg His Gln Glu Ala Lys Val Pro Val Ala Ile Arg Val Leu Asp
465                 470                 475                 480
```

```
Val Asn Asp Asn Ala Pro Lys Phe Ala Ala Pro Tyr Glu Gly Phe Ile
                485                 490                 495

Cys Glu Ser Asp Gln Thr Lys Pro Leu Ser Asn Gln Pro Ile Val Thr
            500                 505                 510

Ile Ser Ala Asp Asp Lys Asp Asp Thr Ala Asn Gly Pro Arg Phe Ile
        515                 520                 525

Phe Ser Leu Pro Pro Glu Ile Ile His Asn Pro Asn Phe Thr Val Arg
    530                 535                 540

Asp Asn Arg Asp Asn Thr Ala Gly Val Tyr Ala Arg Arg Gly Gly Phe
545                 550                 555                 560

Ser Arg Gln Lys Gln Asp Leu Tyr Leu Leu Pro Ile Val Ile Ser Asp
                565                 570                 575

Gly Gly Ile Pro Pro Met Ser Ser Thr Asn Thr Leu Thr Ile Lys Val
            580                 585                 590

Cys Gly Cys Asp Val Asn Gly Ala Leu Leu Ser Cys Asn Ala Glu Ala
        595                 600                 605

Tyr Ile Leu Asn Ala Gly Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu
    610                 615                 620

Ala Cys Ile Val Ile Leu Leu Gly Cys Pro Ser Leu Met Glu Pro Pro
625                 630                 635                 640

Ser Pro Arg Glu Asp Met Arg Leu Leu Tyr Leu Gly Phe Gln Leu Met
                645                 650                 655

Leu Phe Ser Tyr Val Lys Val Asn Arg Arg Phe Cys Leu Leu Gly Val
            660                 665                 670

Phe Ile Lys Leu Pro Phe Leu Tyr Val Val Ala Thr Glu Ser Pro Thr
        675                 680                 685

Thr Leu Thr Ser Leu
    690
```

<210> 56
<211> 1806
<212> PRT
<213> Homo sapiens

<220>
<221> UNSURE
<222> (758)..(758)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (809)..(809)
<223> Xaa = any amino acid

<400> 56

```
Met Glu Pro Trp Ser Ser Arg Trp Lys Thr Lys Arg Trp Leu Trp Asp
1               5                  10                  15

Phe Thr Val Thr Thr Leu Ala Leu Thr Phe Leu Phe Gln Ala Arg Glu
            20                  25                  30

Val Arg Gly Ala Ala Pro Val Asp Val Leu Lys Ala Leu Asp Phe His
        35                  40                  45

Asn Ser Pro Glu Gly Ile Ser Lys Thr Thr Gly Phe Cys Thr Asn Arg
    50                  55                  60

Lys Asn Ser Lys Gly Ser Asp Thr Ala Tyr Arg Val Ser Lys Gln Ala
65                  70                  75                  80

Gln Leu Ser Ala Pro Thr Lys Gln Leu Phe Pro Gly Gly Thr Phe Pro
                85                  90                  95

Glu Asp Phe Ser Ile Leu Phe Thr Val Lys Pro Lys Lys Gly Ile Gln
            100                 105                 110

Ser Phe Leu Leu Ser Ile Tyr Asn Glu His Gly Ile Gln Gln Ile Gly
        115                 120                 125

Val Glu Val Gly Arg Ser Pro Val Phe Leu Phe Glu Asp His Thr Gly
    130                 135                 140

Lys Pro Ala Pro Glu Asp Tyr Pro Leu Phe Arg Thr Val Asn Ile Ala
145                 150                 155                 160

Asp Gly Lys Trp His Arg Val Ala Ile Ser Val Glu Lys Lys Thr Val
                165                 170                 175

Thr Met Ile Val Asp Cys Lys Lys Lys Thr Thr Lys Pro Leu Asp Arg
            180                 185                 190

Ser Glu Arg Ala Ile Val Asp Thr Asn Gly Ile Thr Val Phe Gly Thr
        195                 200                 205

Arg Ile Leu Asp Glu Glu Val Phe Glu Gly Asp Ile Gln Gln Phe Leu
    210                 215                 220

Ile Thr Gly Asp Pro Lys Ala Ala Tyr Asp Tyr Cys Glu His Tyr Ser
225                 230                 235                 240

Pro Asp Cys Asp Ser Ser Ala Pro Lys Ala Ala Gln Ala Gln Glu Pro
                245                 250                 255

Gln Ile Asp Glu Tyr Ala Pro Glu Asp Ile Ile Glu Tyr Asp Tyr Glu
            260                 265                 270

Tyr Gly Glu Ala Glu Tyr Lys Glu Ala Glu Ser Val Thr Glu Gly Pro
        275                 280                 285

Thr Val Thr Glu Glu Thr Ile Ala Gln Thr Glu Ala Asn Ile Val Asp
    290                 295                 300

Asp Phe Gln Glu Tyr Asn Tyr Gly Thr Met Glu Ser Tyr Gln Thr Glu
```

305 310 315 320

Ala Pro Arg His Val Ser Gly Thr Asn Glu Pro Asn Pro Val Glu Glu
325 330 335

Ile Phe Thr Glu Glu Tyr Leu Thr Gly Glu Asp Tyr Asp Ser Gln Arg
340 345 350

Lys Asn Ser Glu Asp Thr Leu Tyr Glu Asn Lys Glu Ile Asp Gly Arg
355 360 365

Asp Ser Asp Leu Leu Val Asp Gly Asp Leu Gly Glu Tyr Asp Phe Tyr
370 375 380

Glu Tyr Lys Glu Tyr Glu Asp Lys Pro Thr Ser Pro Pro Asn Glu Glu
385 390 395 400

Phe Gly Pro Gly Val Pro Ala Glu Thr Asp Ile Thr Glu Thr Ser Ile
405 410 415

Asn Gly His Gly Ala Tyr Gly Glu Lys Gly Gln Lys Gly Glu Pro Ala
420 425 430

Val Val Glu Pro Gly Met Leu Val Glu Gly Pro Pro Gly Pro Ala Gly
435 440 445

Pro Ala Gly Ile Met Gly Pro Pro Gly Leu Gln Gly Pro Thr Gly Pro
450 455 460

Pro Gly Asp Pro Gly Asp Arg Gly Pro Pro Gly Arg Pro Gly Leu Pro
465 470 475 480

Gly Ala Asp Gly Leu Pro Gly Pro Pro Gly Thr Met Leu Met Leu Pro
485 490 495

Phe Arg Tyr Gly Gly Asp Gly Ser Lys Gly Pro Thr Ile Ser Ala Gln
500 505 510

Glu Ala Gln Ala Gln Ala Ile Leu Gln Gln Ala Arg Ile Ala Leu Arg
515 520 525

Gly Pro Pro Gly Pro Met Gly Leu Thr Gly Arg Pro Gly Pro Val Gly
530 535 540

Gly Pro Gly Ser Ser Gly Ala Lys Gly Glu Ser Gly Asp Pro Gly Pro
545 550 555 560

Gln Gly Pro Arg Gly Val Gln Gly Pro Pro Gly Pro Thr Gly Lys Pro
565 570 575

Gly Lys Arg Gly Arg Pro Gly Ala Asp Gly Gly Arg Gly Met Pro Gly
580 585 590

Glu Pro Gly Ala Lys Gly Asp Arg Gly Phe Asp Gly Leu Pro Gly Leu
595 600 605

Pro Gly Asp Lys Gly His Arg Gly Glu Arg Gly Pro Gln Gly Pro Pro
610 615 620

Gly Pro Pro Gly Asp Asp Gly Met Arg Gly Glu Asp Gly Glu Ile Gly

625 630 635 640

Pro Arg Gly Leu Pro Gly Glu Ala Gly Pro Arg Gly Leu Leu Gly Pro
645 650 655

Arg Gly Thr Pro Gly Ala Pro Gly Gln Pro Gly Met Ala Gly Val Asp
660 665 670

Gly Pro Pro Gly Pro Lys Gly Asn Met Gly Pro Gln Gly Glu Pro Gly
675 680 685

Pro Pro Gly Gln Gln Gly Asn Pro Gly Pro Gln Gly Leu Pro Gly Pro
690 695 700

Gln Gly Pro Ile Gly Pro Pro Gly Glu Lys Gly Pro Gln Gly Lys Pro
705 710 715 720

Gly Leu Ala Gly Leu Pro Gly Ala Asp Gly Pro Pro Gly His Pro Gly
725 730 735

Lys Glu Gly Gln Ser Gly Glu Lys Gly Ala Leu Gly Pro Pro Gly Pro
740 745 750

Gln Gly Pro Ile Gly Xaa Pro Gly Pro Arg Gly Val Lys Gly Ala Asp
755 760 765

Gly Val Arg Gly Leu Lys Gly Ser Lys Gly Glu Lys Gly Glu Asp Gly
770 775 780

Phe Pro Gly Phe Lys Gly Asp Met Gly Leu Lys Gly Asp Arg Gly Glu
785 790 795 800

Val Gly Gln Ile Gly Pro Arg Gly Xaa Asp Gly Pro Glu Gly Pro Lys
805 810 815

Gly Arg Ala Gly Pro Thr Gly Asp Pro Gly Pro Ser Gly Gln Ala Gly
820 825 830

Glu Lys Gly Lys Leu Gly Val Pro Gly Leu Pro Gly Tyr Pro Gly Arg
835 840 845

Gln Gly Pro Lys Gly Ser Thr Gly Phe Pro Gly Phe Pro Gly Ala Asn
850 855 860

Gly Glu Lys Gly Ala Arg Gly Val Ala Gly Lys Pro Gly Pro Arg Gly
865 870 875 880

Gln Arg Gly Pro Thr Gly Pro Arg Gly Ser Arg Gly Ala Arg Gly Pro
885 890 895

Thr Gly Lys Pro Gly Pro Lys Gly Thr Ser Gly Gly Asp Gly Pro Pro
900 905 910

Gly Pro Pro Gly Glu Arg Gly Pro Gln Gly Pro Gln Gly Pro Val Gly
915 920 925

Phe Pro Gly Pro Lys Gly Pro Pro Gly Pro Pro Gly Arg Met Gly Cys
930 935 940

Pro Gly His Pro Gly Gln Arg Gly Glu Thr Gly Phe Gln Gly Lys Thr

945 950 955 960

Gly Pro Pro Gly Pro Gly Gly Val Val Gly Pro Gln Gly Pro Thr Gly
965 970 975

Glu Thr Gly Pro Ile Gly Glu Arg Gly Tyr Pro Gly Pro Pro Gly Pro
980 985 990

Pro Gly Glu Gln Gly Leu Pro Gly Ala Ala Gly Lys Glu Gly Ala Lys
995 1000 1005

Gly Asp Pro Gly Pro Gln Gly Ile Ser Gly Lys Asp Gly Pro Ala
1010 1015 1020

Gly Leu Arg Gly Phe Pro Gly Glu Arg Gly Leu Pro Gly Ala Gln
1025 1030 1035

Gly Ala Pro Gly Leu Lys Gly Gly Glu Gly Pro Gln Gly Pro Pro
1040 1045 1050

Gly Pro Val Gly Ser Pro Gly Glu Arg Gly Ser Ala Gly Thr Ala
1055 1060 1065

Gly Pro Ile Gly Leu Arg Gly Arg Pro Gly Pro Gln Gly Pro Pro
1070 1075 1080

Gly Pro Ala Gly Glu Lys Gly Ala Pro Gly Glu Lys Gly Pro Gln
1085 1090 1095

Gly Pro Ala Gly Arg Asp Gly Val Gln Gly Pro Val Gly Leu Pro
1100 1105 1110

Gly Pro Ala Gly Pro Ala Gly Ser Pro Gly Glu Asp Gly Asp Lys
1115 1120 1125

Gly Glu Ile Gly Glu Pro Gly Gln Lys Gly Ser Lys Gly Gly Lys
1130 1135 1140

Gly Glu Asn Gly Pro Pro Gly Pro Pro Gly Leu Gln Gly Pro Val
1145 1150 1155

Gly Ala Pro Gly Ile Ala Gly Gly Asp Gly Glu Pro Gly Pro Arg
1160 1165 1170

Gly Gln Gln Gly Met Phe Gly Gln Lys Gly Asp Glu Gly Ala Arg
1175 1180 1185

Gly Phe Pro Gly Pro Pro Gly Pro Ile Gly Leu Gln Gly Leu Pro
1190 1195 1200

Gly Pro Pro Gly Glu Lys Gly Glu Asn Gly Asp Val Gly Pro Trp
1205 1210 1215

Gly Pro Pro Gly Pro Pro Gly Pro Arg Gly Pro Gln Gly Pro Asn
1220 1225 1230

Gly Ala Asp Gly Pro Gln Gly Pro Pro Gly Ser Val Gly Ser Val
1235 1240 1245

Gly Gly Val Gly Glu Lys Gly Glu Pro Gly Glu Ala Gly Asn Pro

1250 1255 1260

Gly Pro Pro Gly Glu Ala Gly Val Gly Gly Pro Lys Gly Glu Arg
1265 1270 1275

Gly Glu Lys Gly Glu Ala Gly Pro Pro Gly Ala Ala Gly Pro Pro
1280 1285 1290

Gly Ala Lys Gly Pro Pro Gly Asp Asp Gly Pro Lys Gly Asn Pro
1295 1300 1305

Gly Pro Val Gly Phe Pro Gly Asp Pro Gly Pro Pro Gly Glu Leu
1310 1315 1320

Gly Pro Ala Gly Gln Asp Gly Val Gly Gly Asp Lys Gly Glu Asp
1325 1330 1335

Gly Asp Pro Gly Gln Pro Gly Pro Pro Gly Pro Ser Gly Glu Ala
1340 1345 1350

Gly Pro Pro Gly Pro Pro Gly Lys Arg Gly Pro Pro Gly Ala Ala
1355 1360 1365

Gly Ala Glu Gly Arg Gln Gly Glu Lys Gly Ala Lys Gly Glu Ala
1370 1375 1380

Gly Ala Glu Gly Pro Pro Gly Lys Thr Gly Pro Val Gly Pro Gln
1385 1390 1395

Gly Pro Ala Gly Lys Pro Gly Pro Glu Gly Leu Arg Gly Ile Pro
1400 1405 1410

Gly Pro Val Gly Glu Gln Gly Leu Pro Gly Ala Ala Gly Gln Asp
1415 1420 1425

Gly Pro Pro Gly Pro Met Gly Pro Pro Gly Leu Pro Gly Leu Lys
1430 1435 1440

Gly Asp Pro Gly Ser Lys Gly Glu Lys Gly His Pro Gly Leu Ile
1445 1450 1455

Gly Leu Ile Gly Pro Pro Gly Glu Gln Gly Glu Lys Gly Asp Arg
1460 1465 1470

Gly Leu Pro Gly Thr Gln Gly Ser Pro Gly Ala Lys Gly Asp Gly
1475 1480 1485

Gly Ile Pro Gly Pro Ala Gly Pro Leu Gly Pro Pro Gly Pro Pro
1490 1495 1500

Gly Leu Pro Gly Pro Gln Gly Pro Lys Gly Asn Lys Gly Ser Thr
1505 1510 1515

Gly Pro Ala Gly Gln Lys Gly Asp Ser Gly Leu Pro Gly Pro Pro
1520 1525 1530

Gly Pro Pro Gly Pro Pro Gly Glu Val Ile Gln Pro Leu Pro Ile
1535 1540 1545

Leu Ser Ser Lys Lys Thr Arg Arg His Thr Glu Gly Met Gln Ala

1550 1555 1560

Asp Ala Asp Asp Asn Ile Leu Asp Tyr Ser Asp Gly Met Glu Glu
1565 1570 1575

Ile Phe Gly Ser Leu Asn Ser Leu Lys Gln Asp Ile Glu His Met
1580 1585 1590

Lys Phe Pro Met Gly Thr Gln Thr Asn Pro Ala Arg Thr Cys Lys
1595 1600 1605

Asp Leu Gln Leu Ser His Pro Asp Phe Pro Asp Gly Glu Tyr Trp
1610 1615 1620

Ile Asp Pro Asn Gln Gly Cys Ser Gly Asp Ser Phe Lys Val Tyr
1625 1630 1635

Cys Asn Phe Thr Ser Gly Gly Glu Thr Cys Ile Tyr Pro Asp Lys
1640 1645 1650

Lys Ser Glu Gly Val Arg Ile Ser Ser Trp Pro Lys Glu Lys Pro
1655 1660 1665

Gly Ser Trp Phe Ser Glu Phe Lys Arg Gly Lys Leu Leu Ser Tyr
1670 1675 1680

Leu Asp Val Glu Gly Asn Ser Ile Asn Met Val Gln Met Thr Phe
1685 1690 1695

Leu Lys Leu Leu Thr Ala Ser Ala Arg Gln Asn Phe Thr Tyr His
1700 1705 1710

Cys His Gln Ser Ala Ala Trp Tyr Asp Val Ser Ser Gly Ser Tyr
1715 1720 1725

Asp Lys Ala Leu Arg Phe Leu Gly Ser Asn Asp Glu Glu Met Ser
1730 1735 1740

Tyr Asp Asn Asn Pro Phe Ile Lys Thr Leu Tyr Asp Gly Cys Thr
1745 1750 1755

Ser Arg Lys Gly Tyr Glu Lys Thr Val Ile Glu Ile Asn Thr Pro
1760 1765 1770

Lys Ile Asp Gln Val Pro Ile Val Asp Val Met Ile Ser Asp Phe
1775 1780 1785

Gly Asp Gln Asn Gln Lys Phe Gly Phe Glu Val Gly Pro Val Cys
1790 1795 1800

Phe Leu Gly
1805

<210> 57
<211> 755
<212> PRT
<213> Homo sapiens

<400> 57

```
Cys Lys Ala Ala Lys Ala Asp Leu Val Phe Met Val Asp Gly Ser Trp
1               5                  10                  15

Ser Ile Gly Asp Glu Asn Phe Asn Lys Ile Ile Ser Phe Leu Tyr Ser
            20                  25                  30

Thr Val Gly Ala Leu Asn Lys Ile Gly Thr Asp Gly Thr Gln Val Ala
        35                  40                  45

Met Val Gln Phe Thr Asp Asp Pro Arg Thr Glu Phe Lys Leu Asn Ala
    50                  55                  60

Tyr Lys Thr Lys Glu Thr Leu Leu Asp Ala Ile Lys His Ile Ser Tyr
65                  70                  75                  80

Lys Gly Gly Asn Thr Lys Thr Gly Lys Ala Ile Lys Tyr Val Arg Asp
                85                  90                  95

Thr Leu Phe Thr Ala Glu Ser Gly Thr Arg Arg Gly Ile Pro Lys Val
            100                 105                 110

Ile Val Val Ile Thr Asp Gly Arg Ser Gln Asp Asp Val Asn Lys Ile
        115                 120                 125

Ser Arg Glu Met Gln Leu Asp Gly Tyr Ser Ile Phe Ala Ile Gly Val
    130                 135                 140

Ala Asp Ala Asp Tyr Ser Glu Leu Val Ser Ile Gly Ser Lys Pro Ser
145                 150                 155                 160

Ala Arg His Val Phe Phe Val Asp Asp Phe Asp Ala Phe Lys Lys Ile
                165                 170                 175

Glu Asp Glu Leu Ile Thr Phe Val Cys Glu Thr Ala Ser Ala Thr Cys
            180                 185                 190

Pro Val Val His Lys Asp Gly Ile Asp Leu Ala Gly Phe Lys Met Met
        195                 200                 205

Glu Met Phe Gly Leu Val Glu Lys Asp Phe Ser Ser Val Glu Gly Val
    210                 215                 220

Ser Met Glu Pro Gly Thr Phe Asn Val Phe Pro Cys Tyr Gln Leu His
225                 230                 235                 240

Lys Asp Ala Leu Val Ser Gln Pro Thr Arg Tyr Leu His Pro Glu Gly
                245                 250                 255

Leu Pro Ser Asp Tyr Thr Ile Ser Phe Leu Phe Arg Ile Leu Pro Asp
            260                 265                 270

Thr Pro Gln Glu Pro Phe Ala Leu Trp Glu Ile Leu Asn Lys Asn Ser
        275                 280                 285

Asp Pro Leu Val Gly Val Ile Leu Asp Asn Gly Gly Lys Thr Leu Thr
    290                 295                 300

Tyr Phe Asn Tyr Asp Gln Ser Gly Asp Phe Gln Thr Val Thr Phe Glu
305                 310                 315                 320
```

```
Gly Pro Glu Ile Arg Lys Ile Phe Tyr Gly Ser Phe His Lys Leu His
                325                 330                 335

Ile Val Val Ser Glu Thr Leu Val Lys Val Val Ile Asp Cys Lys Gln
            340                 345                 350

Val Gly Glu Lys Ala Met Asn Ala Ser Ala Asn Ile Thr Ser Asp Gly
        355                 360                 365

Val Glu Val Leu Gly Lys Met Val Arg Ser Arg Gly Pro Gly Gly Asn
    370                 375                 380

Ser Ala Pro Phe Gln Leu Gln Met Phe Asp Ile Val Cys Ser Thr Ser
385                 390                 395                 400

Trp Ala Asn Thr Asp Lys Cys Cys Glu Leu Pro Gly Leu Arg Asp Asp
                405                 410                 415

Glu Ser Cys Pro Asp Leu Pro His Ser Cys Ser Cys Ser Glu Thr Asn
            420                 425                 430

Glu Val Ala Leu Gly Pro Ala Gly Pro Pro Gly Gly Pro Gly Leu Arg
        435                 440                 445

Gly Pro Lys Gly Gln Gln Gly Glu Pro Gly Pro Lys Gly Pro Asp Gly
    450                 455                 460

Pro Arg Gly Glu Ile Gly Leu Pro Gly Pro Gln Gly Pro Pro Gly Pro
465                 470                 475                 480

Gln Gly Pro Ser Gly Leu Ser Ile Gln Gly Met Pro Gly Met Pro Gly
                485                 490                 495

Glu Lys Gly Glu Lys Gly Asp Thr Gly Leu Pro Gly Pro Gln Gly Ile
            500                 505                 510

Pro Gly Gly Val Gly Ser Pro Gly Arg Asp Gly Ser Pro Gly Gln Arg
        515                 520                 525

Gly Leu Pro Gly Lys Asp Gly Ser Ser Gly Pro Pro Gly Pro Pro Gly
    530                 535                 540

Pro Ile Gly Ile Pro Gly Thr Pro Gly Val Pro Gly Ile Thr Gly Ser
545                 550                 555                 560

Met Gly Pro Gln Gly Ala Leu Gly Pro Pro Gly Val Pro Gly Ala Lys
                565                 570                 575

Gly Glu Arg Gly Glu Arg Gly Asp Leu Gln Ser Gln Ala Met Val Arg
            580                 585                 590

Ser Val Ala Arg Gln Val Cys Glu Gln Leu Ile Gln Ser His Met Ala
        595                 600                 605

Arg Tyr Thr Ala Ile Leu Asn Gln Ile Pro Ser His Ser Ser Ser Ile
    610                 615                 620

Arg Thr Val Gln Gly Pro Pro Gly Glu Pro Gly Arg Pro Gly Ser Pro
625                 630                 635                 640
```

```
Gly Ala Pro Gly Glu Gln Gly Pro Pro Gly Thr Pro Gly Phe Pro Gly
                645                 650                 655

Asn Ala Gly Val Pro Gly Thr Pro Gly Glu Arg Gly Leu Thr Gly Ile
            660                 665                 670

Lys Gly Glu Lys Gly Asn Pro Gly Val Gly Thr Gln Gly Pro Arg Gly
        675                 680                 685

Pro Pro Gly Pro Ala Gly Pro Ser Gly Glu Ser Arg Pro Gly Ser Pro
    690                 695                 700

Gly Pro Pro Gly Ser Pro Gly Pro Arg Gly Pro Pro Gly His Leu Gly
705                 710                 715                 720

Val Pro Gly Pro Gln Gly Pro Ser Gly Gln Pro Gly Tyr Cys Asp Pro
                725                 730                 735

Ser Ser Cys Ser Ala Tyr Gly Val Arg Asp Leu Ile Pro Tyr Asn Asp
            740                 745                 750

Tyr Gln His
        755

<210>  58
<211>  543
<212>  PRT
<213>  Homo sapiens

<400>  58

Met Gly Thr Ser Leu Ser Pro Asn Asp Pro Trp Pro Leu Asn Pro Leu
1               5                   10                  15

Ser Ile Gln Gln Thr Thr Leu Leu Leu Leu Leu Ser Val Leu Ala Thr
            20                  25                  30

Val His Val Gly Gln Arg Leu Leu Arg Gln Arg Arg Arg Gln Leu Arg
        35                  40                  45

Ser Ala Pro Pro Gly Pro Phe Ala Trp Pro Leu Ile Gly Asn Ala Ala
    50                  55                  60

Ala Val Gly Gln Ala Ala His Leu Ser Phe Ala Arg Leu Ala Arg Arg
65                  70                  75                  80

Tyr Gly Asp Val Phe Gln Ile Arg Leu Gly Ser Cys Pro Ile Val Val
                85                  90                  95

Leu Asn Gly Glu Arg Ala Ile His Gln Ala Leu Val Gln Gln Gly Ser
            100                 105                 110

Ala Phe Ala Asp Arg Pro Ala Phe Ala Ser Phe Arg Val Val Ser Gly
        115                 120                 125

Gly Arg Ser Met Ala Phe Gly His Tyr Ser Glu His Trp Lys Val Gln
    130                 135                 140

Arg Arg Ala Ala His Ser Met Met Arg Asn Phe Phe Thr Arg Gln Pro
145                 150                 155                 160
```

```
Arg Ser Arg Gln Val Leu Glu Gly His Val Leu Ser Glu Ala Arg Glu
                165                 170                 175

Leu Val Ala Leu Leu Val Arg Gly Ser Ala Asp Gly Ala Phe Leu Asp
            180                 185                 190

Pro Arg Pro Leu Thr Val Val Ala Val Ala Asn Val Met Ser Ala Val
        195                 200                 205

Cys Phe Gly Cys Arg Tyr Ser His Asp Asp Pro Glu Phe Arg Glu Leu
    210                 215                 220

Leu Ser His Asn Glu Glu Phe Gly Arg Thr Val Gly Ala Gly Ser Leu
225                 230                 235                 240

Val Asp Val Met Pro Trp Leu Gln Tyr Phe Pro Asn Pro Val Arg Thr
                245                 250                 255

Val Phe Arg Glu Phe Glu Gln Leu Asn Arg Asn Phe Ser Asn Phe Ile
            260                 265                 270

Leu Asp Lys Phe Leu Arg His Cys Glu Ser Leu Arg Pro Gly Ala Ala
        275                 280                 285

Pro Arg Asp Met Met Asp Ala Phe Ile Leu Ser Ala Glu Lys Lys Ala
    290                 295                 300

Ala Gly Asp Ser His Gly Gly Gly Ala Arg Leu Asp Leu Glu Asn Val
305                 310                 315                 320

Pro Ala Thr Ile Thr Asp Ile Phe Gly Ala Ser Gln Asp Thr Leu Ser
                325                 330                 335

Thr Ala Leu Gln Trp Leu Leu Leu Leu Phe Thr Arg Tyr Pro Asp Val
            340                 345                 350

Gln Thr Arg Val Gln Ala Glu Leu Asp Gln Val Val Gly Arg Asp Arg
        355                 360                 365

Leu Pro Cys Met Gly Asp Gln Pro Asn Leu Pro Tyr Val Leu Ala Phe
    370                 375                 380

Leu Tyr Glu Ala Met Arg Phe Ser Ser Phe Val Pro Val Thr Ile Pro
385                 390                 395                 400

His Ala Thr Thr Ala Asn Thr Ser Val Leu Gly Tyr His Ile Pro Lys
                405                 410                 415

Asp Thr Val Val Phe Val Asn Gln Trp Ser Val Asn His Asp Pro Val
            420                 425                 430

Lys Trp Pro Asn Pro Glu Asn Phe Asp Pro Ala Arg Phe Leu Asp Lys
        435                 440                 445

Asp Gly Leu Ile Asn Lys Asp Leu Thr Ser Arg Val Met Ile Phe Ser
    450                 455                 460

Val Gly Lys Arg Arg Cys Ile Gly Glu Glu Leu Ser Lys Met Gln Leu
465                 470                 475                 480
```

Phe Leu Phe Ile Ser Ile Leu Ala His Gln Cys Asp Phe Arg Ala Asn
485 490 495

Pro Asn Glu Pro Ala Lys Met Asn Phe Ser Tyr Gly Leu Thr Ile Lys
500 505 510

Pro Lys Ser Phe Lys Val Asn Val Thr Leu Arg Glu Ser Met Glu Leu
515 520 525

Leu Asp Ser Ala Val Gln Asn Leu Gln Ala Lys Glu Thr Cys Gln
530 535 540

<210> 59
<211> 767
<212> PRT
<213> Homo sapiens

<400> 59

Met Ser Gln Arg Pro Arg Ala Pro Arg Ser Ala Leu Trp Leu Leu Ala
1 5 10 15

Pro Pro Leu Leu Arg Trp Ala Pro Pro Leu Leu Thr Val Leu His Ser
20 25 30

Asp Leu Phe Gln Ala Leu Leu Asp Ile Leu Asp Tyr Tyr Glu Ala Ser
35 40 45

Leu Ser Glu Ser Gln Lys Tyr Arg Tyr Gln Asp Glu Asp Thr Pro Pro
50 55 60

Leu Glu His Ser Pro Ala His Leu Pro Asn Gln Ala Asn Ser Pro Pro
65 70 75 80

Val Ile Val Asn Thr Asp Thr Leu Glu Ala Pro Gly Tyr Glu Leu Gln
85 90 95

Val Asn Gly Thr Glu Gly Glu Met Glu Tyr Glu Glu Ile Thr Leu Glu
100 105 110

Arg Gly Asn Ser Gly Leu Gly Phe Ser Ile Ala Gly Gly Thr Asp Asn
115 120 125

Pro His Ile Gly Asp Asp Pro Ser Ile Phe Ile Thr Lys Ile Ile Pro
130 135 140

Gly Gly Ala Ala Ala Gln Asp Gly Arg Leu Arg Val Asn Asp Ser Ile
145 150 155 160

Leu Phe Val Asn Glu Val Asp Val Arg Glu Val Thr His Ser Ala Ala
165 170 175

Val Glu Ala Leu Lys Glu Ala Gly Ser Ile Val Arg Leu Tyr Val Met
180 185 190

Arg Arg Lys Pro Pro Ala Glu Lys Val Met Glu Ile Lys Leu Ile Lys
195 200 205

Gly Pro Lys Gly Leu Gly Phe Ser Ile Ala Gly Gly Val Gly Asn Gln

```
    210                 215                 220

His Ile Pro Gly Asp Asn Ser Ile Tyr Val Thr Lys Ile Ile Glu Gly
225                 230                 235                 240

Gly Ala Ala His Lys Asp Gly Arg Leu Gln Ile Gly Asp Lys Ile Leu
                245                 250                 255

Ala Val Asn Ser Val Gly Leu Glu Asp Val Met His Glu Asp Ala Val
            260                 265                 270

Ala Ala Leu Lys Asn Thr Tyr Asp Val Val Tyr Leu Lys Val Ala Lys
        275                 280                 285

Pro Ser Asn Ala Tyr Leu Ser Asp Ser Tyr Ala Pro Pro Asp Ile Thr
    290                 295                 300

Thr Ser Tyr Ser Gln His Leu Asp Asn Glu Ile Ser His Ser Ser Tyr
305                 310                 315                 320

Leu Gly Thr Asp Tyr Pro Thr Ala Met Thr Pro Thr Ser Pro Arg Arg
                325                 330                 335

Tyr Ser Pro Val Ala Lys Asp Leu Leu Gly Glu Glu Asp Ile Pro Arg
            340                 345                 350

Glu Pro Arg Arg Ile Val Ile His Arg Gly Ser Thr Gly Leu Gly Phe
        355                 360                 365

Asn Ile Val Gly Gly Glu Asp Gly Glu Gly Ile Phe Ile Ser Phe Ile
    370                 375                 380

Leu Ala Gly Gly Pro Ala Asp Leu Ser Gly Glu Leu Arg Lys Gly Asp
385                 390                 395                 400

Gln Ile Leu Ser Val Asn Gly Val Asp Leu Arg Asn Ala Ser His Glu
                405                 410                 415

Gln Ala Ala Ile Ala Leu Lys Asn Ala Gly Gln Thr Val Thr Ile Ile
            420                 425                 430

Ala Gln Tyr Lys Pro Glu Glu Tyr Ser Arg Phe Glu Ala Lys Ile His
        435                 440                 445

Asp Leu Arg Glu Gln Leu Met Asn Ser Ser Leu Gly Ser Gly Thr Ala
    450                 455                 460

Ser Leu Arg Ser Asn Pro Lys Arg Gly Phe Tyr Ile Arg Ala Leu Phe
465                 470                 475                 480

Asp Tyr Asp Lys Thr Lys Asp Cys Gly Phe Leu Ser Gln Ala Leu Ser
                485                 490                 495

Phe Arg Phe Gly Asp Val Leu His Val Ile Asp Ala Ser Asp Glu Glu
            500                 505                 510

Trp Trp Gln Ala Arg Arg Val His Ser Asp Ser Glu Thr Asp Asp Ile
        515                 520                 525

Gly Phe Ile Pro Ser Lys Arg Arg Val Glu Arg Arg Glu Trp Ser Arg
```

530 535 540

Leu Lys Ala Lys Asp Trp Gly Ser Ser Ser Gly Ser Gln Gly Arg Glu
545 550 555 560

Asp Ser Val Leu Ser Tyr Glu Thr Val Thr Gln Met Glu Val His Tyr
565 570 575

Ala Arg Pro Ile Ile Ile Leu Gly Pro Thr Lys Asp Arg Ala Asn Asp
580 585 590

Asp Leu Leu Ser Glu Phe Pro Asp Lys Phe Gly Ser Cys Val Pro His
595 600 605

Thr Thr Arg Pro Lys Arg Glu Tyr Glu Ile Asp Gly Arg Asp Tyr His
610 615 620

Phe Val Ser Ser Arg Glu Lys Met Glu Lys Asp Ile Gln Ala His Lys
625 630 635 640

Phe Ile Glu Ala Gly Gln Tyr Asn Ser His Leu Tyr Gly Thr Ser Val
645 650 655

Gln Ser Val Arg Glu Val Ala Glu Gln Gly Lys His Cys Ile Leu Asp
660 665 670

Val Ser Ala Asn Ala Val Arg Arg Leu Gln Ala Ala His Leu His Pro
675 680 685

Ile Ala Ile Phe Ile Arg Pro Arg Ser Leu Glu Asn Val Leu Glu Ile
690 695 700

Asn Lys Arg Ile Thr Glu Glu Gln Ala Arg Lys Ala Phe Asp Arg Ala
705 710 715 720

Thr Lys Leu Glu Gln Glu Phe Thr Glu Cys Phe Ser Ala Ile Val Glu
725 730 735

Gly Asp Ser Phe Glu Glu Ile Tyr His Lys Val Lys Arg Val Ile Glu
740 745 750

Asp Leu Ser Gly Pro Tyr Ile Trp Val Pro Ala Arg Glu Arg Leu
755 760 765

<210> 60
<211> 367
<212> PRT
<213> Homo sapiens

<400> 60

Met Val Met Glu Val Gly Thr Leu Asp Ala Gly Gly Leu Arg Ala Leu
1 5 10 15

Leu Gly Glu Arg Ala Ala Gln Cys Leu Leu Leu Asp Cys Arg Ser Phe
20 25 30

Phe Ala Phe Asn Ala Gly His Ile Ala Gly Ser Val Asn Val Arg Phe
35 40 45

```
Ser Thr Ile Val Arg Arg Arg Ala Lys Gly Ala Met Gly Leu Glu His
    50                  55                  60

Ile Val Pro Asn Ala Glu Leu Arg Gly Arg Leu Leu Ala Gly Ala Tyr
65                  70                  75                  80

His Ala Val Val Leu Leu Asp Glu Arg Ser Ala Ala Leu Asp Gly Ala
                85                  90                  95

Lys Arg Asp Gly Thr Leu Ala Leu Ala Ala Gly Ala Leu Cys Arg Glu
            100                 105                 110

Ala Arg Ala Ala Gln Val Phe Phe Leu Lys Gly Gly Tyr Glu Ala Phe
        115                 120                 125

Ser Ala Ser Cys Pro Glu Leu Cys Ser Lys Gln Ser Thr Pro Met Gly
    130                 135                 140

Leu Ser Leu Pro Leu Ser Thr Ser Val Pro Asp Ser Ala Glu Ser Gly
145                 150                 155                 160

Cys Ser Ser Cys Ser Thr Pro Leu Tyr Asp Gln Gly Gly Pro Val Glu
                165                 170                 175

Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala Tyr His Ala Ser Arg Lys
            180                 185                 190

Asp Met Leu Asp Ala Leu Gly Ile Thr Ala Leu Ile Asn Val Ser Ala
        195                 200                 205

Asn Cys Pro Asn His Phe Glu Gly His Tyr Gln Tyr Lys Ser Ile Pro
    210                 215                 220

Val Glu Asp Asn His Lys Ala Asp Ile Ser Ser Trp Phe Asn Glu Ala
225                 230                 235                 240

Ile Asp Phe Ile Asp Ser Ile Lys Asn Ala Gly Gly Arg Val Phe Val
                245                 250                 255

His Cys Gln Ala Gly Ile Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr
            260                 265                 270

Leu Met Arg Thr Asn Arg Val Lys Leu Asp Glu Ala Phe Glu Phe Val
        275                 280                 285

Lys Gln Arg Arg Ser Ile Ile Ser Pro Asn Phe Ser Phe Met Gly Gln
    290                 295                 300

Leu Leu Gln Phe Glu Ser Gln Val Leu Ala Pro His Cys Ser Ala Glu
305                 310                 315                 320

Ala Gly Ser Pro Ala Met Ala Val Leu Asp Arg Gly Thr Ser Thr Thr
                325                 330                 335

Thr Val Phe Asn Phe Pro Val Ser Ile Pro Val His Ser Thr Asn Ser
            340                 345                 350

Ala Leu Ser Tyr Leu Gln Ser Pro Ile Thr Thr Ser Pro Ser Cys
        355                 360                 365
```

<210> 61
<211> 345
<212> PRT
<213> Homo sapiens

<400> 61

Met Ala Ala Ala Glu Pro Ala Ser Ser Gly Gln Gln Ala Pro Ala Gly
1 5 10 15

Gln Gly Gln Gly Gln Arg Pro Pro Pro Gln Pro Pro Gln Ala Gln Ala
20 25 30

Pro Gln Pro Pro Pro Pro Pro Gln Leu Gly Gly Ala Gly Gly Gly Ser
35 40 45

Ser Arg His Glu Lys Ser Leu Gly Leu Leu Thr Thr Lys Phe Val Ser
50 55 60

Leu Leu Gln Glu Ala Lys Asp Gly Val Leu Asp Leu Lys Ala Ala Ala
65 70 75 80

Asp Thr Leu Ala Val Arg Gln Lys Arg Arg Ile Tyr Asp Ile Thr Asn
85 90 95

Val Leu Glu Gly Ile Asp Leu Ile Glu Lys Lys Ser Lys Asn Ser Ile
100 105 110

Gln Trp Lys Gly Val Gly Ala Gly Cys Asn Thr Lys Glu Val Ile Asp
115 120 125

Arg Leu Arg Tyr Leu Lys Ala Glu Ile Glu Asp Leu Glu Leu Lys Glu
130 135 140

Arg Glu Leu Asp Gln Gln Lys Leu Trp Leu Gln Gln Ser Ile Lys Asn
145 150 155 160

Val Met Asp Asp Ser Ile Asn Asn Arg Phe Ser Tyr Val Thr His Glu
165 170 175

Asp Ile Cys Asn Cys Phe Asn Gly Asp Thr Leu Leu Ala Ile Gln Ala
180 185 190

Pro Ser Gly Thr Gln Leu Glu Val Pro Ile Pro Glu Met Gly Gln Asn
195 200 205

Gly Gln Lys Lys Tyr Gln Ile Asn Leu Lys Ser His Ser Gly Pro Ile
210 215 220

His Val Leu Leu Ile Asn Lys Glu Ser Ser Ser Ser Lys Pro Val Val
225 230 235 240

Phe Pro Val Pro Pro Pro Asp Asp Leu Thr Gln Pro Ser Ser Gln Ser
245 250 255

Leu Thr Pro Val Thr Pro Gln Lys Ser Ser Met Ala Thr Gln Asn Leu
260 265 270

Pro Glu Gln His Val Ser Glu Arg Ser Gln Ala Leu Gln Gln Thr Ser
275 280 285

Ala Thr Asp Ile Ser Ser Gly Ser Ile Ser Gly Asp Ile Ile Asp Glu
290 295 300

Leu Met Ser Ser Asp Val Phe Pro Leu Leu Arg Leu Ser Pro Thr Pro
305 310 315 320

Ala Asp Asp Tyr Asn Phe Asn Leu Asp Asp Asn Glu Gly Val Cys Asp
325 330 335

Leu Phe Asp Val Gln Ile Leu Asn Tyr
340 345

<210> 62
<211> 427
<212> PRT
<213> Homo sapiens

<400> 62

Met Glu Thr Leu Cys Leu Arg Ala Ser Phe Trp Leu Ala Leu Val Gly
1 5 10 15

Cys Val Ile Ser Asp Asn Pro Glu Arg Tyr Ser Thr Asn Leu Ser Asn
20 25 30

His Val Asp Asp Phe Thr Thr Phe Arg Gly Thr Glu Leu Ser Phe Leu
35 40 45

Val Thr Thr His Gln Pro Thr Asn Leu Val Leu Pro Ser Asn Gly Ser
50 55 60

Met His Asn Tyr Cys Pro Gln Gln Thr Lys Ile Thr Ser Ala Phe Lys
65 70 75 80

Tyr Ile Asn Thr Val Ile Ser Cys Thr Ile Phe Ile Val Gly Met Val
85 90 95

Gly Asn Ala Thr Leu Leu Arg Ile Ile Tyr Gln Asn Lys Cys Met Arg
100 105 110

Asn Gly Pro Asn Ala Leu Ile Ala Ser Leu Ala Leu Gly Asp Leu Ile
115 120 125

Tyr Val Val Ile Asp Leu Pro Ile Asn Val Phe Lys Leu Leu Ala Gly
130 135 140

Arg Trp Pro Phe Asp His Asn Asp Phe Gly Val Phe Leu Cys Lys Leu
145 150 155 160

Phe Pro Phe Leu Gln Lys Ser Ser Val Gly Ile Thr Val Leu Asn Leu
165 170 175

Cys Ala Leu Ser Val Asp Arg Tyr Arg Ala Val Ala Ser Trp Ser Arg
180 185 190

Val Gln Gly Ile Gly Ile Pro Leu Val Thr Ala Ile Glu Ile Val Ser
195 200 205

Ile Trp Ile Leu Ser Phe Ile Leu Ala Ile Pro Glu Ala Ile Gly Phe

210 215 220

Val Met Val Pro Phe Glu Tyr Arg Gly Glu Gln His Lys Thr Cys Met
225 230 235 240

Leu Asn Ala Thr Ser Lys Phe Met Glu Phe Tyr Gln Asp Val Lys Asp
245 250 255

Trp Trp Leu Phe Gly Phe Tyr Phe Cys Met Pro Leu Val Cys Thr Ala
260 265 270

Ile Phe Tyr Thr Leu Met Thr Cys Glu Met Leu Asn Arg Arg Asn Gly
275 280 285

Ser Leu Arg Ile Ala Leu Ser Glu His Leu Lys Gln Arg Arg Glu Val
290 295 300

Ala Lys Thr Val Phe Cys Leu Val Val Ile Phe Ala Leu Cys Trp Phe
305 310 315 320

Pro Leu His Leu Ser Arg Ile Leu Lys Lys Thr Val Tyr Asn Glu Met
325 330 335

Asp Lys Asn Arg Cys Glu Leu Leu Ser Phe Leu Leu Leu Met Asp Tyr
340 345 350

Ile Gly Ile Asn Leu Ala Thr Met Asn Ser Cys Ile Asn Pro Ile Ala
355 360 365

Leu Tyr Phe Val Ser Lys Lys Phe Lys Asn Cys Phe Gln Ser Cys Leu
370 375 380

Cys Cys Cys Cys Tyr Gln Ser Lys Ser Leu Met Thr Ser Val Pro Met
385 390 395 400

Asn Gly Thr Ser Ile Gln Trp Lys Asn His Asp Gln Asn Asn His Asn
405 410 415

Thr Asp Arg Ser Ser His Lys Asp Ser Met Asn
420 425

<210> 63
<211> 405
<212> PRT
<213> Homo sapiens

<400> 63

Met Glu Arg Leu Gln Lys Gln Pro Leu Thr Ser Pro Gly Ser Val Ser
1 5 10 15

Pro Ser Arg Asp Ser Ser Val Pro Gly Ser Pro Ser Ser Ile Val Ala
20 25 30

Lys Met Asp Asn Gln Val Leu Gly Tyr Lys Asp Leu Ala Ala Ile Pro
35 40 45

Lys Asp Lys Ala Ile Leu Asp Ile Glu Arg Pro Asp Leu Met Ile Tyr
50 55 60

```
Glu Pro His Phe Thr Tyr Ser Leu Leu Glu His Val Glu Leu Pro Arg
65                  70                  75                  80

Gln Arg Glu Arg Ser Leu Ser Pro Lys Ser Thr Ser Pro Pro Pro Ser
                85                  90                  95

Pro Glu Val Trp Ala Asp Ser Arg Ser Pro Gly Ile Ile Ser Gln Ala
            100                 105                 110

Ser Ala Pro Arg Thr Thr Gly Thr Pro Arg Thr Ser Leu Pro His Phe
        115                 120                 125

His His Pro Glu Thr Ser Arg Pro Asp Ser Asn Ile Tyr Lys Lys Pro
    130                 135                 140

Pro Ile Tyr Lys Gln Arg Glu Ser Val Gly Gly Ser Pro Gln Thr Lys
145                 150                 155                 160

His Leu Ile Glu Asp Leu Ile Ile Glu Ser Ser Lys Phe Pro Ala Ala
                165                 170                 175

Gln Pro Pro Asp Pro Asn Gln Pro Ala Lys Ile Glu Thr Asp Tyr Trp
            180                 185                 190

Pro Cys Pro Pro Ser Leu Ala Val Val Glu Thr Glu Trp Arg Lys Arg
        195                 200                 205

Lys Ala Ser Arg Arg Gly Ala Glu Glu Glu Glu Glu Glu Glu Asp Asp
    210                 215                 220

Asp Ser Gly Glu Glu Met Lys Ala Leu Arg Glu Arg Gln Arg Glu Glu
225                 230                 235                 240

Leu Ser Lys Val Thr Ser Asn Leu Gly Lys Met Ile Leu Lys Glu Glu
                245                 250                 255

Met Glu Lys Ser Leu Pro Ile Arg Arg Lys Thr Arg Ser Leu Pro Asp
            260                 265                 270

Arg Thr Pro Phe His Thr Ser Leu His Gln Gly Thr Ser Lys Ser Ser
        275                 280                 285

Ser Leu Pro Arg Tyr Gly Arg Thr Thr Leu Ser Arg Leu Gln Ser Thr
    290                 295                 300

Glu Phe Ser Pro Ser Gly Ser Glu Thr Gly Ser Pro Gly Leu Gln Asn
305                 310                 315                 320

Gly Glu Gly Gln Arg Gly Arg Met Asp Arg Gly Asn Ser Leu Pro Cys
                325                 330                 335

Val Leu Glu Gln Lys Ile Tyr Pro Tyr Glu Met Leu Val Val Thr Asn
            340                 345                 350

Lys Gly Arg Thr Lys Leu Pro Pro Gly Val Asp Arg Met Arg Leu Glu
        355                 360                 365

Arg His Leu Ser Ala Glu Asp Phe Ser Arg Val Phe Ala Met Ser Pro
    370                 375                 380
```

Glu Glu Phe Gly Lys Leu Ala Leu Trp Lys Arg Asn Glu Leu Lys Lys
385 390 395 400

Lys Ala Ser Leu Phe
405

<210> 64
<211> 916
<212> PRT
<213> Homo sapiens

<400> 64

Met Glu Ser Gly Gln Pro Ala Arg Arg Ile Ala Met Ala Pro Leu Leu
1 5 10 15

Glu Tyr Glu Arg Gln Leu Val Leu Glu Leu Leu Asp Thr Asp Gly Leu
20 25 30

Val Val Cys Ala Arg Gly Leu Gly Ala Asp Arg Leu Leu Tyr His Phe
35 40 45

Leu Gln Leu His Cys His Pro Ala Cys Leu Val Leu Val Leu Asn Thr
50 55 60

Gln Pro Ala Glu Glu Glu Tyr Phe Ile Asn Gln Leu Lys Ile Glu Gly
65 70 75 80

Val Glu His Leu Pro Arg Arg Val Thr Asn Glu Ile Thr Ser Asn Ser
85 90 95

Arg Tyr Glu Val Tyr Thr Gln Gly Gly Val Ile Phe Ala Thr Ser Arg
100 105 110

Ile Leu Val Val Asp Phe Leu Thr Asp Arg Ile Pro Ser Asp Leu Ile
115 120 125

Thr Gly Ile Leu Val Tyr Arg Ala His Arg Ile Ile Glu Ser Cys Gln
130 135 140

Glu Ala Phe Ile Leu Arg Leu Phe Arg Gln Lys Asn Lys Arg Gly Phe
145 150 155 160

Ile Lys Ala Phe Thr Asp Asn Ala Val Ala Phe Asp Thr Gly Phe Cys
165 170 175

His Val Glu Arg Val Met Arg Asn Leu Phe Val Arg Lys Leu Tyr Leu
180 185 190

Trp Pro Arg Phe His Val Ala Val Asn Ser Phe Leu Glu Gln His Lys
195 200 205

Pro Glu Val Val Glu Ile His Val Ser Met Thr Pro Thr Met Leu Ala
210 215 220

Ile Gln Thr Ala Ile Leu Asp Ile Leu Asn Ala Cys Leu Lys Glu Leu
225 230 235 240

Lys Cys His Asn Pro Ser Leu Glu Val Glu Asp Leu Ser Leu Glu Asn
245 250 255

```
Ala Ile Gly Lys Pro Phe Asp Lys Thr Ile Arg His Tyr Leu Asp Pro
            260                 265                 270

Leu Trp His Gln Leu Gly Ala Lys Thr Lys Ser Leu Val Gln Asp Leu
        275                 280                 285

Lys Ile Leu Arg Thr Leu Leu Gln Tyr Leu Ser Gln Tyr Asp Cys Val
    290                 295                 300

Thr Phe Leu Asn Leu Leu Glu Ser Leu Arg Ala Thr Glu Lys Ala Phe
305                 310                 315                 320

Gly Gln Asn Ser Gly Trp Leu Phe Leu Asp Ser Ser Thr Ser Met Phe
                325                 330                 335

Ile Asn Ala Arg Ala Arg Val Tyr His Leu Pro Asp Ala Lys Met Ser
            340                 345                 350

Lys Lys Glu Lys Ile Ser Glu Lys Met Glu Ile Lys Glu Gly Glu Glu
        355                 360                 365

Thr Lys Lys Glu Leu Val Leu Glu Ser Asn Pro Lys Trp Glu Ala Leu
    370                 375                 380

Thr Glu Val Leu Lys Glu Ile Glu Ala Glu Asn Lys Glu Ser Glu Ala
385                 390                 395                 400

Leu Gly Gly Pro Gly Gln Val Leu Ile Cys Ala Ser Asp Asp Arg Thr
                405                 410                 415

Cys Ser Gln Leu Arg Asp Tyr Ile Thr Leu Gly Ala Glu Ala Phe Leu
            420                 425                 430

Leu Arg Leu Tyr Arg Lys Thr Phe Glu Lys Asp Ser Lys Ala Glu Glu
        435                 440                 445

Val Trp Met Lys Phe Arg Lys Glu Asp Ser Ser Lys Arg Ile Arg Lys
    450                 455                 460

Ser His Lys Arg Pro Lys Asp Pro Gln Asn Lys Glu Arg Ala Ser Thr
465                 470                 475                 480

Lys Glu Arg Thr Leu Lys Lys Lys Lys Arg Lys Leu Thr Leu Thr Gln
                485                 490                 495

Met Val Gly Lys Pro Glu Glu Leu Glu Glu Glu Gly Asp Val Glu Glu
            500                 505                 510

Gly Tyr Arg Arg Glu Ile Ser Ser Ser Pro Glu Ser Cys Pro Glu Glu
        515                 520                 525

Ile Lys His Glu Glu Phe Asp Val Asn Leu Ser Ser Asp Ala Ala Phe
    530                 535                 540

Gly Ile Leu Lys Glu Pro Leu Thr Ile Ile His Pro Leu Leu Gly Cys
545                 550                 555                 560

Ser Asp Pro Tyr Ala Leu Thr Arg Val Leu His Glu Val Glu Pro Arg
                565                 570                 575
```

```
Tyr Val Val Leu Tyr Asp Ala Glu Leu Thr Phe Val Arg Gln Leu Glu
            580                 585                 590

Ile Tyr Arg Ala Ser Arg Pro Gly Lys Pro Leu Arg Val Tyr Phe Leu
        595                 600                 605

Ile Tyr Gly Gly Ser Thr Glu Glu Gln Arg Tyr Leu Thr Ala Leu Arg
    610                 615                 620

Lys Glu Lys Glu Ala Phe Glu Lys Leu Ile Arg Glu Lys Ala Ser Met
625                 630                 635                 640

Val Val Pro Glu Glu Arg Glu Gly Arg Asp Glu Thr Asn Leu Asp Leu
                645                 650                 655

Val Arg Gly Thr Ala Ser Ala Asp Val Ser Thr Asp Thr Arg Lys Ala
            660                 665                 670

Gly Gly Gln Glu Gln Asn Gly Thr Gln Gln Ser Ile Val Val Asp Met
        675                 680                 685

Arg Glu Phe Arg Ser Glu Leu Pro Ser Leu Ile His Arg Arg Gly Ile
    690                 695                 700

Asp Ile Glu Pro Val Thr Leu Glu Val Gly Asp Tyr Ile Leu Thr Pro
705                 710                 715                 720

Glu Met Cys Val Glu Arg Lys Ser Ile Ser Asp Leu Ile Gly Ser Leu
                725                 730                 735

Asn Asn Gly Arg Leu Tyr Ser Gln Cys Ile Ser Met Ser Arg Tyr Tyr
            740                 745                 750

Lys Arg Pro Val Leu Leu Ile Glu Phe Asp Pro Ser Lys Pro Phe Ser
        755                 760                 765

Leu Thr Ser Arg Gly Ala Leu Phe Gln Glu Ile Ser Ser Asn Asp Ile
    770                 775                 780

Ser Ser Lys Leu Thr Leu Leu Thr Leu His Phe Pro Arg Leu Arg Ile
785                 790                 795                 800

Leu Trp Cys Pro Ser Pro His Ala Thr Ala Glu Leu Phe Glu Glu Leu
                805                 810                 815

Lys Gln Ser Lys Pro Gln Pro Asp Ala Ala Thr Ala Leu Ala Ile Thr
            820                 825                 830

Ala Asp Ser Glu Thr Leu Pro Glu Ser Glu Lys Tyr Asn Pro Gly Pro
        835                 840                 845

Gln Asp Phe Leu Leu Lys Met Pro Gly Val Asn Ala Lys Asn Cys Arg
    850                 855                 860

Ser Leu Met His His Val Lys Asn Ile Ala Glu Leu Ala Ala Leu Ser
865                 870                 875                 880

Gln Asp Glu Leu Thr Ser Ile Leu Gly Asn Ala Ala Asn Ala Lys Gln
                885                 890                 895
```

```
Leu Tyr Asp Phe Ile His Thr Ser Phe Ala Glu Val Val Ser Lys Gly
            900                 905                 910

Lys Gly Lys Lys
        915

<210>  65
<211>  297
<212>  PRT
<213>  Homo sapiens

<400>  65

Glu Phe Gly Ala Lys Ser Asn Gln Gln Leu Asp Arg Lys Arg Met Ala
1               5                   10                  15

Leu Lys Gln Ile Ser Ser Asn Lys Cys Phe Gly Gly Leu Gln Lys Val
            20                  25                  30

Phe Glu His Asp Ser Val Glu Leu Asn Cys Lys Met Lys Phe Ala Val
        35                  40                  45

Tyr Leu Pro Pro Lys Ala Glu Thr Gly Lys Cys Pro Ala Cys Ile Gly
    50                  55                  60

Ser Pro Gly Leu Thr Cys Thr Glu Pro Lys Phe Tyr His Gln Asn Leu
65                  70                  75                  80

Val Ile Ile Ser Leu Leu Gln Asn His Leu Ser Cys Cys His Cys Ser
                85                  90                  95

Arg Tyr Ser Pro Arg Ala Cys Asn Ile Lys Gly Glu Asp Glu Ser Trp
            100                 105                 110

Asp Phe Ala Thr Gly Arg Gly Phe Tyr Val Asp Ala Thr Glu Asp Pro
        115                 120                 125

Trp Lys Thr Asn Tyr Arg Met Tyr Ser Tyr Val Thr Glu Glu Leu Pro
    130                 135                 140

Gln Leu Ile Asn Ala Asn Phe Pro Val Asp Pro Gln Arg Met Ser Ile
145                 150                 155                 160

Phe Gly His Ser Met Gly Gly His Gly Ala Leu Ile Cys Ala Leu Lys
                165                 170                 175

Asn Pro Gly Lys Tyr Lys Ser Val Ser Ala Phe Ala Pro Ile Cys Asn
            180                 185                 190

Pro Val Leu Cys Pro Trp Gly Lys Lys Ala Phe Ser Gly Tyr Leu Gly
        195                 200                 205

Thr Asp Gln Ser Lys Trp Lys Ala Tyr Asp Ala Thr His Leu Val Lys
    210                 215                 220

Ser Tyr Pro Gly Ser Gln Leu Asp Ile Leu Ile Asp Gln Gly Lys Asp
225                 230                 235                 240

Asp Gln Phe Leu Leu Asp Gly Gln Leu Leu Pro Asp Asn Phe Ile Ala
```

245 250 255

Ala Cys Thr Glu Lys Lys Ile Pro Val Val Phe Arg Leu Gln Glu Gly
260 265 270

Tyr Asp His Ser Tyr Tyr Phe Ile Ala Thr Phe Ile Thr Asp His Ile
275 280 285

Arg His His Ala Lys Tyr Leu Asn Ala
290 295

<210> 66
<211> 756
<212> PRT
<213> Homo sapiens

<400> 66

Met Ser Pro Gln Lys Arg Val Lys Asn Val Gln Ala Gln Asn Arg Thr
1 5 10 15

Ser Gln Gly Ser Ser Ser Phe Gln Thr Thr Leu Ser Ala Trp Lys Val
20 25 30

Lys Gln Asp Pro Ser Asn Ser Lys Asn Ile Ser Lys His Gly Gln Asn
35 40 45

Asn Pro Val Gly Asp Tyr Glu His Ala Asp Asp Gln Ala Glu Glu Asp
50 55 60

Ala Leu Gln Met Ala Val Gly Tyr Phe Glu Lys Gly Pro Ile Lys Ala
65 70 75 80

Ser Gln Asn Lys Asp Lys Thr Leu Glu Lys His Leu Lys Thr Val Glu
85 90 95

Asn Val Ala Trp Lys Asn Gly Leu Ala Ser Glu Glu Ile Asp Ile Leu
100 105 110

Leu Asn Ile Ala Leu Ser Gly Lys Phe Gly Asn Ala Val Asn Thr Arg
115 120 125

Ile Leu Lys Cys Met Ile Pro Ala Thr Val Ile Ser Glu Asp Ser Val
130 135 140

Val Lys Ala Val Ser Trp Leu Cys Val Gly Lys Cys Ser Gly Ser Thr
145 150 155 160

Lys Val Leu Phe Tyr Arg Trp Leu Val Ala Met Phe Asp Phe Ile Asp
165 170 175

Arg Lys Glu Gln Ile Asn Leu Leu Tyr Gly Phe Phe Phe Ala Ser Leu
180 185 190

Gln Asp Asp Ala Leu Cys Pro Tyr Val Cys His Leu Leu Tyr Leu Leu
195 200 205

Thr Lys Lys Glu Asn Val Lys Pro Phe Arg Val Arg Lys Leu Leu Asp
210 215 220

```
Leu Gln Ala Lys Met Gly Met Gln Pro His Leu Gln Ala Leu Leu Ser
225                 230                 235                 240

Leu Tyr Lys Phe Phe Ala Pro Ala Leu Ile Ser Val Ser Leu Pro Val
            245                 250                 255

Arg Lys Lys Ile Tyr Leu Gln Asn Ser Glu Asn Leu Trp Lys Thr Ala
        260                 265                 270

Leu Leu Ala Val Lys Gln Arg Asn Arg Gly Pro Ser Pro Glu Pro Leu
    275                 280                 285

Lys Leu Met Leu Gly Pro Ala Asn Val Arg Pro Leu Lys Arg Lys Trp
290                 295                 300

Asn Ser Leu Ser Val Ile Pro Val Leu Asn Ser Ser Ser Tyr Thr Lys
305                 310                 315                 320

Glu Cys Gly Lys Lys Glu Met Ser Leu Ser Asp Cys Leu Asn Arg Ser
                325                 330                 335

Gly Ser Phe Pro Leu Glu Gln Leu Gln Ser Phe Pro Gln Leu Leu Gln
        340                 345                 350

Asn Ile His Cys Leu Glu Leu Pro Ser Gln Met Gly Ser Val Leu Asn
    355                 360                 365

Asn Ser Leu Leu Leu His Tyr Ile Asn Cys Val Arg Asp Glu Pro Val
370                 375                 380

Leu Leu Arg Phe His Tyr Trp Leu Ser Gln Thr Leu Gln Glu Glu Cys
385                 390                 395                 400

Ile Trp Tyr Lys Val Asn Asn Tyr Glu His Gly Lys Glu Phe Thr Asn
                405                 410                 415

Phe Leu Asp Thr Ile Ile Arg Ala Glu Cys Phe Leu Gln Glu Gly Tyr
        420                 425                 430

Tyr Ser Cys Glu Ala Phe Leu Tyr Lys Ser Leu Pro Leu Trp Asp Gly
    435                 440                 445

Leu Ser Cys Arg Ser Gln Phe Leu Gln Leu Val Ser Trp Ile Pro Phe
450                 455                 460

Ser Ser Phe Ser Glu Val Lys Pro Leu Leu Phe Asp His Leu Ala Gln
465                 470                 475                 480

Leu Phe Phe Thr Ser Thr Ile Tyr Phe Lys Cys Ser Val Leu Gln Ser
                485                 490                 495

Leu Lys Glu Leu Leu Gln Asn Trp Leu Leu Trp Leu Ser Met Asp Ile
        500                 505                 510

His Met Lys Pro Val Thr Asn Ser Pro Leu Glu Thr Thr Leu Gly Gly
    515                 520                 525

Ser Met Asn Cys Val Ser Lys Leu Ile His Tyr Val Gly Trp Leu Ser
530                 535                 540
```

```
Thr Thr Ala Met Arg Leu Glu Ser Asn Asn Thr Phe Leu Leu His Phe
545                 550                 555                 560

Ile Leu Asp Phe Tyr Glu Lys Val Cys Asp Ile Tyr Ile Asn Tyr Asp
                565                 570                 575

Leu Pro Leu Val Val Leu Phe Pro Pro Gly Ile Phe Tyr Ser Ala Leu
            580                 585                 590

Leu Ser Leu Asp Thr Ser Ile Leu Asn Gln Leu Cys Phe Ile Met His
        595                 600                 605

Arg Tyr Arg Lys Asn Leu Thr Ala Ala Lys Lys Asn Glu Leu Val Gln
    610                 615                 620

Lys Thr Lys Ser Glu Phe Asn Phe Ser Ser Lys Thr Tyr Gln Glu Phe
625                 630                 635                 640

Asn Tyr Tyr Leu Thr Ser Met Val Gly Cys Leu Trp Thr Ser Lys Pro
                645                 650                 655

Phe Ala Lys Gly Ile Tyr Ile Asp Pro Glu Ile Leu Glu Lys Thr Gly
            660                 665                 670

Val Ala Glu Tyr Lys Asn Ser Leu Asn Val Val His His Pro Ser Phe
        675                 680                 685

Leu Ser Tyr Ala Val Ser Phe Leu Leu Gln Glu Ser Pro Glu Glu Arg
    690                 695                 700

Thr Val Asn Val Ser Ser Ile Arg Gly Lys Lys Trp Ser Trp Tyr Leu
705                 710                 715                 720

Asp Tyr Leu Phe Ser Gln Gly Leu Gln Gly Leu Lys Leu Phe Ile Arg
                725                 730                 735

Ser Ser Val His His Ser Ser Ile Pro Arg Ala Glu Gly Ile Asn Cys
            740                 745                 750

Asn Asn Gln Tyr
        755

<210>  67
<211>  504
<212>  PRT
<213>  Homo sapiens

<400>  67

Met Glu Ala Pro Leu Gln Thr Glu Met Val Glu Leu Val Pro Asn Gly
1               5                   10                  15

Lys His Ser Glu Gly Leu Leu Pro Val Ile Thr Pro Met Ala Gly Asn
            20                  25                  30

Gln Arg Val Glu Asp Pro Ala Arg Ser Cys Met Glu Gly Lys Ser Phe
        35                  40                  45

Leu Gln Lys Ser Pro Ser Lys Glu Pro His Phe Thr Asp Phe Glu Gly
    50                  55                  60
```

```
Lys Thr Ser Phe Gly Met Ser Val Phe Asn Leu Ser Asn Ala Ile Met
65                  70                  75                  80

Gly Ser Gly Ile Leu Gly Leu Ala Tyr Ala Met Ala Asn Thr Gly Ile
                85                  90                  95

Ile Leu Phe Leu Phe Leu Leu Thr Ala Val Ala Leu Leu Ser Ser Tyr
            100                 105                 110

Ser Ile His Leu Leu Leu Lys Ser Ser Gly Val Val Gly Ile Arg Ala
        115                 120                 125

Tyr Glu Gln Leu Gly Tyr Arg Ala Phe Gly Thr Pro Gly Lys Leu Ala
    130                 135                 140

Ala Ala Leu Ala Ile Thr Leu Gln Asn Ile Gly Ala Met Ser Ser Tyr
145                 150                 155                 160

Leu Tyr Ile Ile Lys Ser Glu Leu Pro Leu Val Ile Gln Thr Phe Leu
                165                 170                 175

Asn Leu Glu Glu Lys Thr Ser Asp Trp Tyr Met Asn Gly Asn Tyr Leu
            180                 185                 190

Val Ile Leu Val Ser Val Thr Ile Ile Leu Pro Leu Ala Leu Met Arg
        195                 200                 205

Gln Leu Gly Tyr Leu Gly Tyr Ser Ser Gly Phe Ser Leu Ser Cys Met
    210                 215                 220

Val Phe Phe Leu Ile Ala Val Ile Tyr Lys Lys Phe His Val Pro Cys
225                 230                 235                 240

Pro Leu Pro Pro Asn Phe Asn Asn Thr Thr Gly Asn Phe Ser His Val
                245                 250                 255

Glu Ile Val Lys Glu Lys Val Gln Leu Gln Val Glu Pro Glu Ala Ser
            260                 265                 270

Ala Phe Cys Thr Pro Ser Tyr Phe Thr Leu Asn Ser Gln Thr Ala Tyr
        275                 280                 285

Thr Ile Pro Ile Met Ala Phe Ala Phe Val Cys His Pro Glu Val Leu
    290                 295                 300

Pro Ile Tyr Thr Glu Leu Lys Asp Pro Ser Lys Lys Lys Met Gln His
305                 310                 315                 320

Ile Ser Asn Leu Ser Ile Ala Val Met Tyr Ile Met Tyr Phe Leu Ala
                325                 330                 335

Ala Leu Phe Gly Tyr Leu Thr Phe Tyr Asn Gly Val Glu Ser Glu Leu
            340                 345                 350

Leu His Thr Tyr Ser Lys Val Asp Pro Phe Asp Val Leu Ile Leu Cys
        355                 360                 365

Val Arg Val Ala Val Leu Thr Ala Val Thr Leu Thr Val Pro Ile Val
    370                 375                 380
```

```
Leu Phe Pro Val Arg Arg Ala Ile Gln Gln Met Leu Phe Pro Asn Gln
385                 390                 395                 400

Glu Phe Ser Trp Leu Arg His Val Leu Ile Ala Val Gly Leu Leu Thr
                405                 410                 415

Cys Ile Asn Leu Leu Val Ile Phe Ala Pro Asn Ile Leu Gly Ile Phe
            420                 425                 430

Gly Val Ile Gly Ala Thr Ser Ala Pro Phe Leu Ile Phe Ile Phe Pro
        435                 440                 445

Ala Ile Phe Tyr Phe Arg Ile Met Pro Thr Glu Lys Glu Pro Ala Arg
    450                 455                 460

Ser Thr Pro Lys Ile Leu Ala Leu Cys Phe Ala Met Leu Gly Phe Leu
465                 470                 475                 480

Leu Met Thr Met Ser Leu Ser Phe Ile Ile Ile Asp Trp Ala Ser Gly
                485                 490                 495

Thr Ser Arg His Gly Gly Asn His
            500
```

<210> 68
<211> 145
<212> PRT
<213> Homo sapiens

<400> 68

```
Met Ala Thr Trp Ala Leu Leu Leu Leu Ala Ala Met Leu Leu Gly Asn
1               5                   10                  15

Pro Gly Leu Val Phe Ser Arg Leu Ser Pro Glu Tyr Tyr Asp Leu Ala
            20                  25                  30

Arg Ala His Leu Arg Asp Glu Glu Lys Ser Cys Pro Cys Leu Ala Gln
        35                  40                  45

Glu Gly Pro Gln Gly Asp Leu Leu Thr Lys Thr Gln Glu Leu Gly Arg
    50                  55                  60

Asp Tyr Arg Thr Cys Leu Thr Ile Val Gln Lys Leu Lys Lys Met Val
65                  70                  75                  80

Asp Lys Pro Thr Gln Arg Ser Val Ser Asn Ala Ala Thr Arg Val Cys
                85                  90                  95

Arg Thr Gly Arg Ser Arg Trp Arg Asp Val Cys Arg Asn Phe Met Arg
            100                 105                 110

Arg Tyr Gln Ser Arg Val Ile Gln Gly Leu Val Ala Gly Glu Thr Ala
        115                 120                 125

Gln Gln Ile Cys Glu Asp Leu Arg Leu Cys Ile Pro Ser Thr Gly Pro
    130                 135                 140

Leu
```

145

<210> 69
<211> 128
<212> PRT
<213> Homo sapiens

<400> 69

Met Trp Ser Thr Arg Ser Pro Asn Ser Thr Ala Trp Pro Leu Ser Leu
1 5 10 15

Glu Pro Asp Pro Gly Met Ala Ser Ala Ser Thr Thr Met His Thr Thr
20 25 30

Thr Ile Ala Glu Pro Asp Pro Gly Met Ser Gly Trp Pro Asp Gly Arg
35 40 45

Met Glu Thr Ser Thr Pro Thr Ile Met Asp Ile Val Val Ile Ala Gly
50 55 60

Val Ile Ala Ala Val Ala Ile Val Leu Val Ser Leu Leu Phe Val Met
65 70 75 80

Leu Arg Tyr Met Tyr Arg His Lys Gly Thr Tyr His Thr Asn Glu Ala
85 90 95

Lys Gly Thr Glu Phe Ala Glu Ser Ala Asp Ala Ala Leu Gln Gly Asp
100 105 110

Pro Ala Leu Gln Asp Ala Gly Asp Ser Ser Arg Lys Glu Tyr Phe Ile
115 120 125

<210> 70
<211> 4861
<212> PRT
<213> Homo sapiens

<400> 70

Met Ala Thr Met Ile Pro Pro Val Lys Leu Lys Trp Leu Glu His Leu
1 5 10 15

Asn Ser Ser Trp Ile Thr Glu Asp Ser Glu Ser Ile Ala Thr Arg Glu
20 25 30

Gly Val Ala Val Leu Tyr Ser Lys Leu Val Ser Asn Lys Glu Val Val
35 40 45

Pro Leu Pro Gln Gln Val Leu Cys Leu Lys Gly Pro Gln Leu Pro Asp
50 55 60

Phe Glu Arg Glu Ser Leu Ser Ser Asp Glu Gln Asp His Tyr Leu Asp
65 70 75 80

Ala Leu Leu Ser Ser Gln Leu Ala Leu Ala Lys Met Val Cys Ser Asp
85 90 95

Ser Pro Phe Ala Gly Ala Leu Arg Lys Arg Leu Leu Val Leu Gln Arg
100 105 110

```
Val Phe Tyr Ala Leu Ser Asn Lys Tyr His Asp Lys Gly Lys Val Lys
        115                 120                 125

Gln Gln Gln His Ser Pro Glu Ser Ser Ser Gly Ser Ala Asp Val His
    130                 135                 140

Ser Val Ser Glu Arg Pro Arg Ser Ser Thr Asp Ala Leu Ile Glu Met
145                 150                 155                 160

Gly Val Arg Thr Gly Leu Ser Leu Leu Phe Ala Leu Leu Arg Gln Ser
                165                 170                 175

Trp Met Met Pro Val Ser Gly Pro Gly Leu Ser Leu Cys Asn Asp Val
            180                 185                 190

Ile His Thr Ala Ile Glu Val Val Ser Ser Leu Pro Pro Leu Ser Leu
        195                 200                 205

Ala Asn Glu Ser Lys Ile Pro Pro Met Gly Leu Asp Cys Leu Ser Gln
    210                 215                 220

Val Thr Thr Phe Leu Lys Gly Val Thr Ile Pro Asn Ser Gly Ala Asp
225                 230                 235                 240

Thr Leu Gly Arg Arg Leu Ala Ser Glu Leu Leu Leu Gly Leu Ala Ala
                245                 250                 255

Gln Arg Gly Ser Leu Arg Tyr Leu Leu Glu Trp Ile Glu Met Ala Leu
            260                 265                 270

Gly Ala Ser Ala Val Val His Thr Met Glu Lys Gly Lys Leu Leu Ser
        275                 280                 285

Ser Gln Glu Gly Met Ile Ser Phe Asp Cys Phe Met Thr Ile Leu Met
    290                 295                 300

Gln Met Arg Arg Ser Leu Gly Ser Ser Ala Asp Arg Ser Gln Trp Arg
305                 310                 315                 320

Glu Pro Thr Arg Thr Ser Asp Gly Leu Cys Ser Leu Tyr Glu Ala Ala
                325                 330                 335

Leu Cys Leu Phe Glu Glu Val Cys Arg Met Ala Ser Asp Tyr Ser Arg
            340                 345                 350

Thr Cys Ala Ser Pro Asp Ser Ile Gln Thr Gly Asp Ala Pro Ile Val
        355                 360                 365

Ser Glu Thr Cys Glu Val Tyr Val Trp Gly Ser Asn Ser Ser His Gln
    370                 375                 380

Leu Val Glu Gly Thr Gln Glu Lys Ile Leu Gln Pro Lys Leu Ala Pro
385                 390                 395                 400

Ser Phe Ser Asp Ala Gln Thr Ile Glu Ala Gly Gln Tyr Cys Thr Phe
                405                 410                 415

Val Ile Ser Thr Asp Gly Ser Val Arg Ala Cys Gly Lys Gly Ser Tyr
            420                 425                 430
```

```
Gly Arg Leu Gly Leu Gly Asp Ser Asn Asn Gln Ser Thr Leu Lys Lys
        435                 440                 445

Leu Thr Phe Glu Pro His Arg Ser Ile Lys Lys Val Ser Ser Ser Lys
    450                 455                 460

Gly Ser Asp Gly His Thr Leu Ala Phe Thr Thr Glu Gly Glu Val Phe
465                 470                 475                 480

Ser Trp Gly Asp Gly Asp Tyr Gly Lys Leu Gly His Gly Asn Ser Ser
                485                 490                 495

Thr Gln Lys Tyr Pro Lys Leu Ile Gln Gly Pro Leu Gln Gly Lys Val
            500                 505                 510

Val Val Cys Val Ser Ala Gly Tyr Arg His Ser Ala Ala Val Thr Glu
        515                 520                 525

Asp Gly Glu Leu Tyr Thr Trp Gly Glu Gly Asp Phe Gly Arg Leu Gly
    530                 535                 540

His Gly Asp Ser Asn Ser Arg Asn Ile Pro Thr Leu Val Lys Asp Ile
545                 550                 555                 560

Ser Asn Val Gly Glu Val Ser Cys Gly Ser Ser His Thr Ile Ala Leu
                565                 570                 575

Ser Lys Asp Gly Arg Thr Val Trp Ser Phe Gly Gly Gly Asp Asn Gly
            580                 585                 590

Lys Leu Gly His Gly Asp Thr Asn Arg Val Tyr Lys Pro Lys Val Ile
        595                 600                 605

Glu Ala Leu Gln Gly Met Phe Ile Arg Lys Val Cys Ala Gly Ser Gln
    610                 615                 620

Ser Ser Leu Ala Leu Thr Ser Thr Gly Gln Val Tyr Ala Trp Gly Cys
625                 630                 635                 640

Gly Ala Cys Leu Gly Cys Gly Ser Ser Glu Ala Thr Ala Leu Arg Pro
                645                 650                 655

Lys Leu Ile Glu Glu Leu Ala Ala Thr Arg Ile Val Asp Val Ser Ile
            660                 665                 670

Gly Asp Ser His Cys Leu Ala Leu Ser His Asp Asn Glu Val Tyr Ala
        675                 680                 685

Trp Gly Asn Asn Ser Met Gly Gln Cys Gly Gln Gly Asn Ser Thr Gly
    690                 695                 700

Pro Ile Thr Lys Pro Lys Lys Val Ser Gly Leu Asp Gly Ile Ala Ile
705                 710                 715                 720

Gln Gln Ile Ser Ala Gly Thr Ser His Ser Leu Ala Trp Thr Ala Leu
                725                 730                 735

Pro Arg Asp Arg Gln Val Val Ala Trp His Arg Pro Tyr Cys Val Asp
            740                 745                 750
```

```
Leu Glu Glu Ser Thr Phe Ser His Leu Arg Ser Phe Leu Glu Arg Tyr
        755                 760                 765

Cys Asp Lys Ile Asn Ser Glu Ile Pro Pro Leu Pro Phe Pro Ser Ser
    770                 775                 780

Arg Glu His His Ser Phe Leu Lys Leu Cys Leu Lys Leu Leu Ser Asn
785                 790                 795                 800

His Leu Ala Leu Ala Leu Ala Gly Gly Val Ala Thr Ser Ile Leu Gly
                805                 810                 815

Arg Gln Ala Gly Pro Leu Arg Asn Leu Leu Phe Arg Leu Met Asp Ser
            820                 825                 830

Thr Val Pro Asp Glu Ile Gln Glu Val Val Ile Glu Thr Leu Ser Val
        835                 840                 845

Gly Ala Thr Met Leu Leu Pro Pro Leu Arg Glu Arg Met Glu Leu Leu
    850                 855                 860

His Ser Leu Leu Pro Gln Gly Pro Asp Arg Trp Glu Ser Leu Ser Lys
865                 870                 875                 880

Gly Gln Arg Met Gln Leu Asp Ile Ile Leu Thr Ser Leu Gln Asp His
                885                 890                 895

Thr His Val Ala Ser Leu Leu Gly Tyr Ser Ser Pro Ser Asp Ala Ala
            900                 905                 910

Asp Leu Ser Ser Val Cys Thr Gly Tyr Gly Asn Leu Ser Asp Gln Pro
        915                 920                 925

Tyr Gly Thr Gln Ser Cys His Pro Asp Thr His Leu Ala Glu Ile Leu
    930                 935                 940

Met Lys Thr Leu Leu Arg Asn Leu Gly Phe Tyr Thr Asp Gln Ala Phe
945                 950                 955                 960

Gly Glu Leu Glu Lys Asn Ser Asp Lys Phe Leu Leu Gly Thr Ser Ser
                965                 970                 975

Ser Glu Asn Ser Gln Pro Ala His Leu His Glu Leu Leu Cys Ser Leu
            980                 985                 990

Gln Lys Gln Leu Leu Ala Phe Cys His Ile Asn Asn Ile Ser Glu Asn
        995                 1000                1005

Ser Ser Ser Val Ala Leu Leu His Lys His Leu Gln Leu Leu Leu
    1010                1015                1020

Pro His Ala Thr Asp Ile Tyr Ser Arg Ser Ala Asn Leu Leu Lys
    1025                1030                1035

Glu Ser Pro Trp Asn Gly Ser Val Gly Glu Lys Leu Arg Asp Val
    1040                1045                1050

Ile Tyr Val Ser Ala Ala Gly Ser Met Leu Cys Gln Ile Val Asn
    1055                1060                1065
```

```
Ser Leu  Leu Leu Leu Pro Val  Ser Val Ala Arg Pro  Leu Leu Ser
    1070                 1075                 1080

Tyr Leu  Leu Asp Leu Leu Pro  Pro Leu Asp Cys Leu  Asn Arg Leu
    1085                 1090                 1095

Leu Pro  Ala Ala Asp Leu Leu  Glu Asp Gln Glu Leu  Gln Trp Pro
    1100                 1105                 1110

Leu His  Gly Gly Pro Glu Leu  Ile Asp Pro Ala Gly  Leu Pro Leu
    1115                 1120                 1125

Pro Gln  Pro Ala Gln Ser Trp  Val Trp Leu Val Asp  Leu Glu Arg
    1130                 1135                 1140

Thr Ile  Ala Leu Leu Ile Gly  Arg Cys Leu Gly Gly  Met Leu Gln
    1145                 1150                 1155

Gly Ser  Pro Val Ser Pro Glu  Glu Gln Asp Thr Ala  Tyr Trp Met
    1160                 1165                 1170

Lys Thr  Pro Leu Phe Ser Asp  Gly Val Glu Met Asp  Thr Pro Gln
    1175                 1180                 1185

Leu Asp  Lys Cys Met Ser Cys  Leu Leu Glu Val Ala  Leu Ser Gly
    1190                 1195                 1200

Asn Glu  Glu Gln Lys Pro Phe  Asp Tyr Lys Leu Arg  Pro Glu Ile
    1205                 1210                 1215

Ala Val  Tyr Val Asp Leu Ala  Leu Gly Cys Ser Lys  Glu Pro Ala
    1220                 1225                 1230

Arg Ser  Leu Trp Ile Ser Met  Gln Asp Tyr Ala Val  Ser Lys Asp
    1235                 1240                 1245

Trp Asp  Ser Ala Thr Leu Ser  Asn Glu Ser Leu Leu  Asp Thr Val
    1250                 1255                 1260

Ser Arg  Phe Val Leu Ala Ala  Leu Leu Lys His Thr  Asn Leu Leu
    1265                 1270                 1275

Ser Gln  Ala Cys Gly Glu Ser  Arg Tyr Gln Pro Gly  Lys His Leu
    1280                 1285                 1290

Ser Glu  Val Tyr Arg Cys Val  Tyr Lys Val Arg Ser  Arg Leu Leu
    1295                 1300                 1305

Ala Cys  Lys Asn Leu Glu Leu  Ile Gln Thr Arg Ser  Ser Ser Arg
    1310                 1315                 1320

Asp Arg  Trp Ile Ser Glu Asn  Gln Asp Ser Ala Asp  Val Asp Pro
    1325                 1330                 1335

Gln Glu  His Ser Phe Thr Arg  Thr Ile Asp Glu Glu  Ala Glu Met
    1340                 1345                 1350

Glu Glu  Gln Ala Glu Arg Asp  Arg Glu Glu Gly His  Pro Glu Pro
    1355                 1360                 1365
```

Glu Asp Glu Glu Glu Glu Arg Glu His Glu Val Met Thr Ala Gly
1370 1375 1380

Lys Ile Phe Gln Cys Phe Leu Ser Ala Arg Glu Val Ala Arg Ser
1385 1390 1395

Arg Asp Arg Asp Arg Met Asn Ser Gly Ala Gly Ser Gly Ala Arg
1400 1405 1410

Ala Asp Asp Pro Pro Pro Gln Ser Gln Gln Glu Arg Arg Val Ser
1415 1420 1425

Thr Asp Leu Pro Glu Gly Gln Asp Val Tyr Thr Ala Ala Cys Asn
1430 1435 1440

Ser Val Ile His Arg Cys Ala Leu Leu Ile Leu Gly Val Ser Pro
1445 1450 1455

Val Ile Asp Glu Leu Gln Lys Arg Arg Glu Glu Gly Gln Leu Gln
1460 1465 1470

Gln Pro Ser Thr Ser Ala Ser Glu Gly Gly Gly Leu Met Thr Arg
1475 1480 1485

Ser Glu Ser Leu Thr Ala Glu Ser Arg Leu Val His Thr Ser Pro
1490 1495 1500

Asn Tyr Arg Leu Ile Lys Ser Arg Ser Glu Ser Asp Leu Ser Gln
1505 1510 1515

Pro Glu Ser Asp Glu Glu Gly Tyr Ala Leu Ser Gly Arg Gln Asn
1520 1525 1530

Val Asp Leu Asp Leu Ala Ala Ser His Arg Lys Arg Gly Pro Met
1535 1540 1545

His Ser Gln Leu Glu Ser Leu Ser Asp Ser Trp Ala Arg Leu Lys
1550 1555 1560

His Ser Arg Asp Trp Leu Cys Asn Ser Ser Tyr Ser Phe Glu Ser
1565 1570 1575

Asp Phe Asp Leu Thr Lys Ser Leu Gly Val His Thr Leu Ile Glu
1580 1585 1590

Asn Val Val Ser Phe Val Ser Gly Asp Val Gly Asn Ala Pro Gly
1595 1600 1605

Phe Lys Glu Pro Glu Glu Ser Met Ser Thr Ser Pro Gln Ala Ser
1610 1615 1620

Ile Ile Ala Met Glu Gln Gln Gln Leu Arg Ala Glu Leu Arg Leu
1625 1630 1635

Glu Ala Leu His Gln Ile Leu Val Leu Leu Ser Gly Met Glu Glu
1640 1645 1650

Lys Gly Ser Ile Ser Leu Ala Gly Ser Arg Leu Ser Ser Gly Phe
1655 1660 1665

Gln Ser Ser Thr Leu Leu Thr Ser Val Arg Leu Gln Phe Leu Ala
1670 1675 1680

Gly Cys Phe Gly Leu Gly Thr Val Gly His Thr Gly Ala Lys Gly
1685 1690 1695

Glu Ser Gly Arg Leu His His Tyr Gln Asp Gly Ile Arg Ala Ala
1700 1705 1710

Lys Arg Asn Ile Gln Ile Glu Ile Gln Val Ala Val His Lys Ile
1715 1720 1725

Tyr Gln Gln Leu Ser Ala Thr Leu Glu Arg Ala Leu Gln Ala Asn
1730 1735 1740

Lys His His Ile Glu Ala Gln Gln Arg Leu Leu Leu Val Thr Val
1745 1750 1755

Phe Ala Leu Ser Val His Tyr Gln Pro Val Asp Val Ser Leu Ala
1760 1765 1770

Ile Ser Thr Gly Leu Leu Asn Val Leu Ser Gln Leu Cys Gly Thr
1775 1780 1785

Asp Thr Met Leu Gly Gln Pro Leu Gln Leu Leu Pro Lys Thr Gly
1790 1795 1800

Val Ser Gln Leu Ser Thr Ala Leu Lys Val Ala Ser Thr Arg Leu
1805 1810 1815

Leu Gln Ile Leu Ala Ile Thr Thr Gly Thr Tyr Ala Asp Lys Leu
1820 1825 1830

Ser Pro Lys Val Val Gln Ser Leu Leu Asp Leu Leu Cys Ser Gln
1835 1840 1845

Leu Lys Asn Leu Leu Ser Gln Thr Gly Val Leu His Met Ala Ser
1850 1855 1860

Phe Gly Glu Gly Glu Gln Glu Asp Gly Glu Glu Glu Glu Lys Lys
1865 1870 1875

Val Asp Ser Ser Gly Glu Thr Glu Lys Lys Asp Phe Arg Ala Ala
1880 1885 1890

Leu Arg Lys Gln His Ala Ala Glu Leu His Leu Gly Asp Phe Leu
1895 1900 1905

Val Phe Leu Arg Arg Val Val Ser Ser Lys Ala Ile Gln Ser Lys
1910 1915 1920

Met Ala Ser Pro Lys Trp Thr Glu Val Leu Leu Asn Ile Ala Ser
1925 1930 1935

Gln Lys Cys Ser Ser Gly Ile Pro Leu Val Gly Asn Leu Arg Thr
1940 1945 1950

Arg Leu Leu Ala Leu His Val Leu Glu Ala Val Leu Pro Ala Cys
1955 1960 1965

Glu Ser Gly Val Glu Asp Asp Gln Met Ala Gln Ile Val Glu Arg
1970 1975 1980

Leu Phe Ser Leu Leu Ser Asp Cys Met Trp Glu Thr Pro Ile Ala
1985 1990 1995

Gln Ala Lys His Ala Ile Gln Ile Lys Glu Lys Glu Gln Glu Ile
2000 2005 2010

Lys Leu Gln Lys Gln Gly Glu Leu Glu Glu Glu Asp Glu Asn Leu
2015 2020 2025

Pro Ile Gln Glu Val Ser Phe Asp Pro Glu Lys Ala Gln Cys Cys
2030 2035 2040

Leu Val Glu Asn Gly Gln Ile Leu Thr His Gly Ser Gly Gly Lys
2045 2050 2055

Gly Tyr Gly Leu Ala Ser Thr Gly Val Thr Ser Gly Cys Tyr Gln
2060 2065 2070

Trp Lys Phe Tyr Ile Val Lys Glu Asn Arg Gly Asn Glu Gly Thr
2075 2080 2085

Cys Val Gly Val Ser Arg Trp Pro Val His Asp Phe Asn His Arg
2090 2095 2100

Thr Thr Ser Asp Met Trp Leu Tyr Arg Ala Tyr Ser Gly Asn Leu
2105 2110 2115

Tyr His Asn Gly Glu Gln Thr Leu Thr Leu Ser Ser Phe Thr Gln
2120 2125 2130

Gly Asp Phe Ile Thr Cys Val Leu Asp Met Glu Ala Arg Thr Ile
2135 2140 2145

Ser Phe Gly Lys Asn Gly Glu Glu Pro Lys Leu Ala Phe Glu Asp
2150 2155 2160

Val Asp Ala Ala Glu Leu Tyr Pro Cys Val Met Phe Tyr Ser Ser
2165 2170 2175

Asn Pro Gly Glu Lys Val Lys Ile Cys Asp Met Gln Met Arg Gly
2180 2185 2190

Thr Pro Arg Asp Leu Leu Pro Gly Asp Pro Ile Cys Ser Pro Val
2195 2200 2205

Ala Ala Val Leu Ala Glu Ala Thr Ile Gln Leu Val Arg Ile Leu
2210 2215 2220

His Arg Thr Asp Arg Trp Thr Tyr Cys Ile Asn Lys Lys Met Met
2225 2230 2235

Glu Arg Leu His Lys Ile Lys Ile Cys Ile Lys Glu Ser Gly Gln
2240 2245 2250

Lys Leu Lys Lys Ser Arg Ser Val Gln Ser Arg Glu Glu Asn Glu
2255 2260 2265

Met Arg Glu Glu Lys Glu Ser Lys Glu Glu Glu Lys Gly Lys His
2270 2275 2280

Thr Arg His Gly Leu Ala Asp Leu Ser Glu Leu Gln Leu Arg Thr
2285 2290 2295

Leu Cys Ile Glu Val Trp Pro Val Leu Ala Val Ile Gly Gly Val
2300 2305 2310

Asp Ala Gly Leu Arg Val Gly Gly Arg Cys Val His Lys Gln Thr
2315 2320 2325

Gly Arg His Ala Thr Leu Leu Gly Val Val Lys Glu Gly Ser Thr
2330 2335 2340

Ser Ala Lys Val Gln Trp Asp Glu Ala Glu Ile Thr Ile Ser Phe
2345 2350 2355

Pro Thr Phe Trp Ser Pro Ser Asp Thr Pro Leu Tyr Asn Leu Glu
2360 2365 2370

Pro Cys Glu Pro Leu Pro Phe Asp Val Ala Arg Phe Arg Gly Leu
2375 2380 2385

Thr Ala Ser Val Leu Leu Asp Leu Thr Tyr Leu Thr Gly Val His
2390 2395 2400

Glu Asp Met Gly Lys Gln Ser Thr Lys Arg His Glu Lys Lys His
2405 2410 2415

Arg His Glu Ser Glu Glu Lys Gly Asp Val Glu Gln Lys Pro Glu
2420 2425 2430

Ser Glu Ser Ala Leu Asp Met Arg Thr Gly Leu Thr Ser Asp Asp
2435 2440 2445

Val Lys Ser Gln Ser Thr Thr Ser Ser Lys Ser Glu Asn Glu Ile
2450 2455 2460

Ala Ser Phe Ser Leu Asp Pro Thr Leu Pro Ser Val Glu Ser Gln
2465 2470 2475

His Gln Ile Thr Glu Gly Lys Arg Lys Asn His Glu His Met Ser
2480 2485 2490

Lys Asn His Asp Val Ala Gln Ser Glu Ile Arg Ala Val Gln Leu
2495 2500 2505

Ser Tyr Leu Tyr Leu Gly Ala Met Lys Ser Leu Ser Ala Leu Leu
2510 2515 2520

Gly Cys Ser Lys Tyr Ala Glu Leu Leu Leu Ile Pro Lys Val Leu
2525 2530 2535

Ala Glu Asn Gly His Asn Ser Asp Cys Ala Ser Ser Pro Val Val
2540 2545 2550

His Glu Asp Val Glu Met Arg Ala Ala Leu Gln Phe Leu Met Arg
2555 2560 2565

His Met Val Lys Arg Ala Val Met Arg Ser Pro Ile Lys Arg Ala
2570 2575 2580

Leu Gly Leu Ala Asp Leu Glu Arg Ala Gln Ala Met Ile Tyr Lys
2585 2590 2595

Leu Val Val His Gly Leu Leu Glu Asp Gln Phe Gly Gly Lys Ile
2600 2605 2610

Lys Gln Glu Ile Asp Gln Gln Ala Glu Glu Ser Asp Pro Ala Gln
2615 2620 2625

Gln Ala Gln Thr Pro Val Thr Thr Ser Pro Ser Ala Ser Ser Thr
2630 2635 2640

Thr Ser Phe Met Ser Ser Ser Leu Glu Asp Thr Thr Thr Ala Thr
2645 2650 2655

Thr Pro Val Thr Asp Thr Glu Thr Val Pro Ala Ser Glu Ser Pro
2660 2665 2670

Gly Val Met Pro Leu Ser Leu Leu Arg Gln Met Phe Ser Ser Tyr
2675 2680 2685

Pro Thr Thr Thr Val Leu Pro Thr Arg Arg Ala Gln Thr Pro Pro
2690 2695 2700

Ile Ser Ser Leu Pro Thr Ser Pro Ser Asp Glu Val Gly Arg Arg
2705 2710 2715

Gln Ser Leu Thr Ser Pro Asp Ser Gln Ser Ala Arg Pro Ala Asn
2720 2725 2730

Arg Thr Ala Leu Ser Asp Pro Ser Ser Arg Leu Ser Thr Ser Pro
2735 2740 2745

Pro Pro Pro Ala Ile Ala Val Pro Leu Leu Glu Met Gly Phe Ser
2750 2755 2760

Leu Arg Gln Ile Ala Lys Ala Met Glu Ala Thr Gly Ala Arg Gly
2765 2770 2775

Glu Ala Asp Ala Gln Asn Ile Thr Val Leu Ala Met Trp Met Ile
2780 2785 2790

Glu His Pro Gly His Glu Asp Glu Glu Glu Pro Gln Ser Gly Ser
2795 2800 2805

Thr Ala Asp Ser Arg Pro Gly Ala Ala Val Leu Gly Ser Gly Gly
2810 2815 2820

Lys Ser Asn Asp Pro Cys Tyr Leu Gln Ser Pro Gly Asp Ile Pro
2825 2830 2835

Ser Ala Asp Ala Ala Glu Met Glu Glu Gly Phe Ser Glu Ser Pro
2840 2845 2850

Asp Asn Leu Asp His Thr Glu Asn Ala Ala Ser Gly Ser Gly Pro
2855 2860 2865

Ser Ala Arg Gly Arg Ser Ala Val Thr Arg Arg His Lys Phe Asp
2870 2875 2880

Leu Ala Ala Arg Thr Leu Leu Ala Arg Ala Ala Gly Leu Tyr Arg
2885 2890 2895

Ser Val Gln Ala His Arg Asn Gln Ser Arg Arg Glu Gly Ile Ser
2900 2905 2910

Leu Gln Gln Asp Pro Gly Ala Leu Tyr Asp Phe Asn Leu Asp Glu
2915 2920 2925

Glu Leu Glu Ile Asp Leu Asp Asp Glu Ala Met Glu Ala Met Phe
2930 2935 2940

Gly Gln Asp Leu Thr Ser Asp Asn Asp Ile Leu Gly Met Trp Ile
2945 2950 2955

Pro Glu Val Leu Asp Trp Pro Thr Trp His Val Cys Glu Ser Glu
2960 2965 2970

Asp Arg Glu Glu Val Val Val Cys Glu Leu Cys Glu Cys Ser Val
2975 2980 2985

Val Ser Phe Asn Gln His Met Lys Arg Asn His Pro Gly Cys Gly
2990 2995 3000

Arg Ser Ala Asn Arg Gln Gly Tyr Arg Ser Asn Gly Ser Tyr Val
3005 3010 3015

Asp Gly Trp Phe Gly Gly Glu Cys Gly Ser Gly Asn Pro Tyr Tyr
3020 3025 3030

Leu Leu Cys Gly Thr Cys Arg Glu Lys Tyr Leu Ala Met Lys Thr
3035 3040 3045

Lys Ser Lys Ser Thr Ser Ser Glu Arg Tyr Lys Gly Gln Ala Pro
3050 3055 3060

Asp Leu Ile Gly Lys Gln Asp Ser Val Tyr Glu Glu Asp Trp Asp
3065 3070 3075

Met Leu Asp Val Asp Glu Asp Glu Lys Leu Thr Gly Glu Glu Glu
3080 3085 3090

Phe Glu Leu Leu Ala Gly Pro Leu Gly Leu Asn Asp Arg Arg Ile
3095 3100 3105

Val Pro Glu Pro Val Gln Phe Pro Asp Ser Asp Pro Leu Gly Ala
3110 3115 3120

Ser Val Ala Met Val Thr Ala Thr Asn Ser Met Glu Glu Thr Leu
3125 3130 3135

Met Gln Ile Gly Cys His Gly Ser Val Glu Lys Ser Ser Ser Gly
3140 3145 3150

Arg Ile Thr Leu Gly Glu Gln Ala Ala Ala Leu Ala Asn Pro His
3155 3160 3165

Asp Arg Val Val Ala Leu Arg Arg Val Thr Ala Ala Ala Gln Val
3170 3175 3180

Leu Leu Ala Arg Thr Met Val Met Arg Ala Leu Ser Leu Leu Ser
3185 3190 3195

Val Ser Gly Ser Ser Cys Ser Leu Ala Ala Gly Leu Glu Ser Leu
3200 3205 3210

Gly Leu Thr Asp Ile Arg Thr Leu Val Arg Leu Met Cys Leu Ala
3215 3220 3225

Ala Ala Gly Arg Ala Gly Leu Ser Thr Ser Pro Ser Ala Met Ala
3230 3235 3240

Ser Thr Ser Glu Arg Ser Arg Gly Gly His Ser Lys Ala Asn Lys
3245 3250 3255

Pro Ile Ser Cys Leu Ala Tyr Leu Ser Thr Ala Val Gly Cys Leu
3260 3265 3270

Ala Ser Asn Ala Pro Ser Ala Ala Lys Leu Leu Val Gln Leu Cys
3275 3280 3285

Thr Gln Asn Leu Ile Ser Ala Ala Thr Gly Val Asn Leu Thr Thr
3290 3295 3300

Val Asp Asp Ser Ile Gln Arg Lys Phe Leu Pro Ser Phe Leu Arg
3305 3310 3315

Gly Ile Ala Glu Glu Asn Lys Leu Val Thr Ser Pro Asn Phe Val
3320 3325 3330

Val Thr Gln Ala Leu Val Ala Leu Leu Ala Asp Lys Gly Ala Lys
3335 3340 3345

Leu Arg Pro Asn Tyr Asp Lys Ser Glu Val Glu Lys Lys Gly Pro
3350 3355 3360

Leu Glu Leu Ala Asn Ala Leu Ala Ala Cys Cys Leu Ser Ser Arg
3365 3370 3375

Leu Ser Ser Gln His Arg Gln Trp Ala Ala Gln Gln Leu Val Arg
3380 3385 3390

Thr Leu Ala Ala His Asp Arg Asp Asn Gln Thr Thr Leu Gln Thr
3395 3400 3405

Leu Ala Asp Met Gly Gly Asp Leu Arg Lys Cys Ser Phe Ile Lys
3410 3415 3420

Leu Glu Ala His Gln Asn Arg Val Met Thr Cys Val Trp Cys Asn
3425 3430 3435

Lys Lys Gly Leu Leu Ala Thr Ser Gly Asn Asp Gly Thr Ile Arg
3440 3445 3450

Val Trp Asn Val Thr Lys Lys Gln Tyr Ser Leu Gln Gln Thr Cys
3455 3460 3465

Val Phe Asn Arg Leu Glu Gly Asp Ala Glu Glu Ser Leu Gly Ser
3470 3475 3480

Pro Ser Asp Pro Ser Phe Ser Pro Val Ser Trp Ser Ile Ser Gly
3485 3490 3495

Lys Tyr Leu Ala Gly Ala Leu Glu Lys Met Val Asn Ile Trp Gln
3500 3505 3510

Val Asn Gly Gly Lys Gly Leu Val Asp Ile Gln Pro His Trp Val
3515 3520 3525

Ser Ala Leu Ala Trp Pro Glu Glu Gly Pro Ala Thr Ala Trp Ser
3530 3535 3540

Gly Glu Ser Pro Glu Leu Leu Leu Val Gly Arg Met Asp Gly Ser
3545 3550 3555

Leu Gly Leu Ile Glu Val Val Asp Val Ser Thr Met His Arg Arg
3560 3565 3570

Glu Leu Glu His Cys Tyr Arg Lys Asp Val Ser Val Thr Cys Ile
3575 3580 3585

Ala Trp Phe Ser Glu Asp Arg Pro Phe Ala Val Gly Tyr Phe Asp
3590 3595 3600

Gly Lys Leu Leu Leu Gly Thr Lys Glu Pro Leu Glu Lys Gly Gly
3605 3610 3615

Ile Val Leu Ile Asp Ala His Lys Asp Thr Leu Ile Ser Met Lys
3620 3625 3630

Trp Asp Pro Thr Gly His Ile Leu Met Thr Cys Ala Lys Glu Asp
3635 3640 3645

Ser Val Lys Leu Trp Gly Ser Ile Ser Gly Cys Trp Cys Cys Leu
3650 3655 3660

His Ser Leu Cys His Pro Ser Ile Val Asn Gly Ile Ala Trp Cys
3665 3670 3675

Arg Leu Pro Gly Lys Gly Ser Lys Leu Gln Leu Leu Met Ala Thr
3680 3685 3690

Gly Cys Gln Ser Gly Leu Val Cys Val Trp Arg Ile Pro Gln Asp
3695 3700 3705

Thr Thr Gln Thr Asn Val Thr Ser Ala Glu Gly Trp Trp Asp Gln
3710 3715 3720

Glu Ser Asn Cys Gln Asp Gly Tyr Arg Lys Ser Ser Gly Ala Lys
3725 3730 3735

Cys Val Tyr Gln Leu Arg Gly His Ile Thr Pro Val Arg Thr Val
3740 3745 3750

Ala Phe Ser Ser Asp Gly Leu Ala Leu Val Ser Gly Gly Leu Gly
3755 3760 3765

```
Gly Leu  Met Asn Ile Trp Ser  Leu Arg Asp Gly Ser  Val Leu Gln
     3770                 3775                 3780

Thr Val  Val Ile Gly Ser Gly  Ala Ile Gln Thr Thr  Val Trp Ile
     3785                 3790                 3795

Pro Glu  Val Gly Val Ala Ala  Cys Ser Asn Arg Ser  Lys Asp Val
     3800                 3805                 3810

Leu Val  Val Asn Cys Thr Ala  Glu Trp Ala Ala Ala  Asn His Val
     3815                 3820                 3825

Leu Ala  Thr Cys Arg Thr Ala  Leu Lys Gln Gln Gly  Val Leu Gly
     3830                 3835                 3840

Leu Asn  Met Ala Pro Cys Met  Arg Ala Phe Leu Glu  Arg Leu Pro
     3845                 3850                 3855

Met Met  Leu Gln Glu Gln Tyr  Ala Tyr Glu Lys Pro  His Val Val
     3860                 3865                 3870

Cys Gly  Asp Gln Leu Val His  Ser Pro Tyr Met Gln  Cys Leu Ala
     3875                 3880                 3885

Ser Leu  Ala Val Gly Leu His  Leu Asp Gln Leu Leu  Cys Asn Pro
     3890                 3895                 3900

Pro Val  Pro Pro His His Gln  Asn Cys Leu Pro Asp  Pro Ala Ser
     3905                 3910                 3915

Trp Asn  Pro Asn Glu Trp Ala  Trp Leu Glu Cys Phe  Ser Thr Thr
     3920                 3925                 3930

Ile Lys  Ala Ala Glu Ala Leu  Thr Asn Gly Ala Gln  Phe Pro Glu
     3935                 3940                 3945

Ser Phe  Thr Val Pro Asp Leu  Glu Pro Val Pro Glu  Asp Glu Leu
     3950                 3955                 3960

Val Phe  Leu Met Asp Asn Ser  Lys Trp Ile Asn Gly  Met Asp Glu
     3965                 3970                 3975

Gln Ile  Met Ser Trp Ala Thr  Ser Arg Pro Glu Asp  Trp His Leu
     3980                 3985                 3990

Gly Gly  Lys Cys Asp Val Tyr  Leu Trp Gly Ala Gly  Arg His Gly
     3995                 4000                 4005

Gln Leu  Ala Glu Ala Gly Arg  Asn Val Met Val Pro  Ala Ala Ala
     4010                 4015                 4020

Pro Ser  Phe Ser Gln Ala Gln  Gln Val Ile Cys Gly  Gln Asn Cys
     4025                 4030                 4035

Thr Phe  Val Ile Gln Ala Asn  Gly Thr Val Leu Ala  Cys Gly Glu
     4040                 4045                 4050

Gly Ser  Tyr Gly Arg Leu Gly  Gln Gly Asn Ser Asp  Asp Leu His
     4055                 4060                 4065
```

Val Leu Thr Val Ile Ser Ala Leu Gln Gly Phe Val Val Thr Gln
4070 4075 4080

Leu Val Thr Ser Cys Gly Ser Asp Gly His Ser Met Ala Leu Thr
4085 4090 4095

Glu Ser Gly Glu Val Phe Ser Trp Gly Asp Gly Asp Tyr Gly Lys
4100 4105 4110

Leu Gly His Gly Asn Ser Asp Arg Gln Arg Arg Pro Arg Gln Ile
4115 4120 4125

Glu Ala Leu Gln Gly Glu Glu Val Val Gln Met Ser Cys Gly Phe
4130 4135 4140

Lys His Ser Ala Val Val Thr Ser Asp Gly Lys Leu Phe Thr Phe
4145 4150 4155

Gly Asn Gly Asp Tyr Gly Arg Leu Gly Leu Gly Asn Thr Ser Asn
4160 4165 4170

Lys Lys Leu Pro Glu Arg Val Thr Ala Leu Glu Gly Tyr Gln Ile
4175 4180 4185

Gly Gln Val Ala Cys Gly Leu Asn His Thr Leu Ala Val Ser Ala
4190 4195 4200

Asp Gly Ser Met Val Trp Ala Phe Gly Asp Gly Asp Tyr Gly Lys
4205 4210 4215

Leu Gly Leu Gly Asn Ser Thr Ala Lys Ser Ser Pro Gln Lys Ile
4220 4225 4230

Asp Val Leu Cys Gly Ile Gly Ile Lys Lys Val Ala Cys Gly Thr
4235 4240 4245

Gln Phe Ser Val Ala Leu Thr Lys Asp Gly His Val Tyr Thr Phe
4250 4255 4260

Gly Gln Asp Arg Leu Ile Gly Leu Pro Glu Gly Arg Ala Arg Asn
4265 4270 4275

His Asn Arg Pro Gln Gln Ile Pro Val Leu Ala Gly Val Ile Ile
4280 4285 4290

Glu Asp Val Ala Val Gly Ala Glu His Thr Leu Ala Leu Ala Ser
4295 4300 4305

Asn Gly Asp Val Tyr Ala Trp Gly Ser Asn Ser Glu Gly Gln Leu
4310 4315 4320

Gly Leu Gly His Thr Asn His Val Arg Glu Pro Thr Leu Val Thr
4325 4330 4335

Gly Leu Gln Gly Lys Asn Val Arg Gln Ile Ser Ala Gly Arg Cys
4340 4345 4350

His Ser Ala Ala Trp Thr Ala Pro Pro Val Pro Pro Arg Ala Pro
4355 4360 4365

Gly Val Ser Val Pro Leu Gln Leu Gly Leu Pro Asp Thr Val Pro
4370 4375 4380

Pro Gln Tyr Gly Ala Leu Arg Glu Val Ser Ile His Thr Val Arg
4385 4390 4395

Ala Arg Leu Arg Leu Leu Tyr His Phe Ser Asp Leu Met Tyr Ser
4400 4405 4410

Ser Trp Arg Leu Leu Asn Leu Ser Pro Asn Asn Gln Asn Ser Thr
4415 4420 4425

Ser His Tyr Asn Ala Gly Thr Trp Gly Ile Val Gln Gly Gln Leu
4430 4435 4440

Arg Pro Leu Leu Ala Pro Arg Val Tyr Thr Leu Pro Met Val Arg
4445 4450 4455

Ser Ile Gly Lys Thr Met Val Gln Gly Lys Asn Tyr Gly Pro Gln
4460 4465 4470

Ile Thr Val Lys Arg Ile Ser Thr Arg Gly Arg Lys Cys Lys Pro
4475 4480 4485

Ile Phe Val Gln Ile Ala Arg Gln Val Val Lys Leu Asn Ala Ser
4490 4495 4500

Asp Leu Arg Leu Pro Ser Arg Ala Trp Lys Val Lys Leu Val Gly
4505 4510 4515

Glu Gly Ala Asp Asp Ala Gly Gly Val Phe Asp Asp Thr Ile Thr
4520 4525 4530

Glu Met Cys Gln Glu Leu Glu Thr Gly Ile Val Asp Leu Leu Ile
4535 4540 4545

Pro Ser Pro Asn Ala Thr Ala Glu Val Gly Tyr Asn Arg Asp Arg
4550 4555 4560

Phe Leu Phe Asn Pro Ser Ala Cys Leu Asp Glu His Leu Met Gln
4565 4570 4575

Phe Lys Phe Leu Gly Ile Leu Met Gly Val Ala Ile Arg Thr Lys
4580 4585 4590

Lys Pro Leu Asp Leu His Leu Ala Pro Leu Val Trp Lys Gln Leu
4595 4600 4605

Cys Cys Val Pro Leu Thr Leu Glu Asp Leu Glu Glu Val Asp Leu
4610 4615 4620

Leu Tyr Val Gln Thr Leu Asn Ser Ile Leu His Ile Glu Asp Ser
4625 4630 4635

Gly Ile Thr Glu Glu Ser Phe His Glu Met Ile Pro Leu Asp Ser
4640 4645 4650

Phe Val Gly Gln Ser Ala Asp Gly Lys Met Val Pro Ile Ile Pro
4655 4660 4665

```
Gly Gly  Asn Ser Ile Pro Leu  Thr Phe Ser Asn Arg  Lys Glu Tyr
    4670                 4675                 4680

Val Glu  Arg Ala Ile Glu Tyr  Arg Leu His Glu Met  Asp Arg Gln
    4685                 4690                 4695

Val Ala  Ala Val Arg Glu Gly  Met Ser Trp Ile Val  Pro Val Pro
    4700                 4705                 4710

Leu Leu  Ser Leu Leu Thr Ala  Lys Gln Leu Glu Gln  Met Val Cys
    4715                 4720                 4725

Gly Met  Pro Glu Ile Ser Val  Glu Val Leu Lys Lys  Val Val Arg
    4730                 4735                 4740

Tyr Arg  Glu Val Asp Glu Gln  His Gln Leu Val Gln  Trp Phe Trp
    4745                 4750                 4755

His Thr  Leu Glu Glu Phe Ser  Asn Glu Glu Arg Val  Leu Phe Met
    4760                 4765                 4770

Arg Phe  Val Ser Gly Arg Ser  Arg Leu Pro Ala Asn  Thr Ala Asp
    4775                 4780                 4785

Ile Ser  Gln Arg Phe Gln Ile  Met Lys Val Asp Arg  Pro Tyr Asp
    4790                 4795                 4800

Ser Leu  Pro Thr Ser Gln Thr  Cys Phe Phe Gln Leu  Arg Leu Pro
    4805                 4810                 4815

Pro Tyr  Ser Ser Gln Leu Val  Met Ala Glu Arg Leu  Arg Tyr Ala
    4820                 4825                 4830

Ile Asn  Asn Cys Arg Ser Ile  Asp Met Asp Asn Tyr  Met Leu Ser
    4835                 4840                 4845

Arg Asn  Val Asp Asn Ala Glu  Gly Ser Asp Thr Asp  Tyr
    4850                 4855                 4860

<210>  71
<211>  292
<212>  PRT
<213>  Homo sapiens

<400>  71

Met Ala Ser Ser Met Arg Ser Leu Phe Ser Asp His Gly Lys Tyr Val
1               5                  10                  15

Glu Ser Phe Arg Arg Phe Leu Asn His Ser Thr Glu His Gln Cys Met
            20                  25                  30

Gln Glu Phe Met Asp Lys Lys Leu Pro Gly Ile Ile Gly Arg Ile Gly
        35                  40                  45

Asp Thr Lys Ser Glu Ile Lys Ile Leu Ser Ile Gly Gly Gly Ala Gly
    50                  55                  60

Glu Ile Asp Leu Gln Ile Leu Ser Lys Val Gln Ala Gln Tyr Pro Gly
```

65 70 75 80

Val Cys Ile Asn Asn Glu Val Val Glu Pro Ser Ala Glu Gln Ile Ala
85 90 95

Lys Tyr Lys Glu Leu Val Ala Lys Thr Ser Asn Leu Glu Asn Val Lys
100 105 110

Phe Ala Trp His Lys Glu Thr Ser Ser Glu Tyr Gln Ser Arg Met Leu
115 120 125

Glu Lys Lys Glu Leu Gln Lys Trp Asp Phe Ile His Met Ile Gln Met
130 135 140

Leu Tyr Tyr Val Lys Asp Ile Pro Ala Thr Leu Lys Phe Phe His Ser
145 150 155 160

Leu Leu Gly Thr Asn Ala Lys Met Leu Ile Ile Val Val Ser Gly Ser
165 170 175

Ser Gly Trp Asp Lys Leu Trp Lys Lys Tyr Gly Ser Arg Phe Pro Gln
180 185 190

Asp Asp Leu Cys Gln Tyr Ile Thr Ser Asp Asp Leu Thr Gln Met Leu
195 200 205

Asp Asn Leu Gly Leu Lys Tyr Glu Cys Tyr Asp Leu Leu Ser Thr Met
210 215 220

Asp Ile Ser Asp Cys Phe Ile Asp Gly Asn Glu Asn Gly Asp Leu Leu
225 230 235 240

Trp Asp Phe Leu Thr Glu Thr Cys Asn Phe Asn Ala Thr Ala Pro Pro
245 250 255

Asp Leu Arg Ala Glu Leu Gly Lys Asp Leu Gln Glu Pro Glu Phe Ser
260 265 270

Ala Lys Lys Glu Gly Lys Val Leu Phe Asn Asn Thr Leu Ser Phe Ile
275 280 285

Val Ile Glu Ala
290

<210> 72
<211> 481
<212> PRT
<213> Homo sapiens

<400> 72

Met Ala Leu Ser Tyr Arg Val Ser Glu Leu Gln Ser Thr Ile Pro Glu
1 5 10 15

His Ile Leu Gln Ser Thr Phe Val His Val Ile Ser Ser Asn Trp Ser
20 25 30

Gly Leu Gln Thr Glu Ser Ile Pro Glu Glu Met Lys Gln Ile Val Glu
35 40 45

```
Glu Gln Gly Asn Lys Leu His Trp Ala Ala Leu Leu Ile Leu Met Val
    50                  55                  60

Ile Ile Pro Thr Ile Gly Gly Asn Thr Leu Val Ile Leu Ala Val Ser
65                  70                  75                  80

Leu Glu Lys Lys Leu Gln Tyr Ala Thr Asn Tyr Phe Leu Met Ser Leu
                85                  90                  95

Ala Val Ala Asp Leu Leu Val Gly Leu Phe Val Met Pro Ile Ala Leu
            100                 105                 110

Leu Thr Ile Met Phe Glu Ala Met Trp Pro Leu Pro Leu Val Leu Cys
        115                 120                 125

Pro Ala Trp Leu Phe Leu Asp Val Leu Phe Ser Thr Ala Ser Ile Met
    130                 135                 140

His Leu Cys Ala Ile Ser Val Asp Arg Tyr Ile Ala Ile Lys Lys Pro
145                 150                 155                 160

Ile Gln Ala Asn Gln Tyr Asn Ser Arg Ala Thr Ala Phe Ile Lys Ile
                165                 170                 175

Thr Val Val Trp Leu Ile Ser Ile Gly Ile Ala Ile Pro Val Pro Ile
            180                 185                 190

Lys Gly Ile Glu Thr Asp Val Asp Asn Pro Asn Asn Ile Thr Cys Val
        195                 200                 205

Leu Thr Lys Glu Arg Phe Gly Asp Phe Met Leu Phe Gly Ser Leu Ala
    210                 215                 220

Ala Phe Phe Thr Pro Leu Ala Ile Met Ile Val Thr Tyr Phe Leu Thr
225                 230                 235                 240

Ile His Ala Leu Gln Lys Lys Ala Tyr Leu Val Lys Asn Lys Pro Pro
                245                 250                 255

Gln Arg Leu Thr Trp Leu Thr Val Ser Thr Val Phe Gln Arg Asp Glu
            260                 265                 270

Thr Pro Cys Ser Ser Pro Glu Lys Val Ala Met Leu Asp Gly Ser Arg
        275                 280                 285

Lys Asp Lys Ala Leu Pro Asn Ser Gly Asp Glu Thr Leu Met Arg Arg
    290                 295                 300

Thr Ser Thr Ile Gly Lys Lys Ser Val Gln Thr Ile Ser Asn Glu Gln
305                 310                 315                 320

Arg Ala Ser Lys Val Leu Gly Ile Val Phe Phe Leu Phe Leu Leu Met
                325                 330                 335

Trp Cys Pro Phe Phe Ile Thr Asn Ile Thr Leu Val Leu Cys Asp Ser
            340                 345                 350

Cys Asn Gln Thr Thr Leu Gln Met Leu Leu Glu Ile Phe Val Trp Ile
        355                 360                 365
```

```
Gly Tyr Val Ser Ser Gly Val Asn Pro Leu Val Tyr Thr Leu Phe Asn
    370                 375                 380

Lys Thr Phe Arg Asp Ala Phe Gly Arg Tyr Ile Thr Cys Asn Tyr Arg
385                 390                 395                 400

Ala Thr Lys Ser Val Lys Thr Leu Arg Lys Arg Ser Ser Lys Ile Tyr
                405                 410                 415

Phe Arg Asn Pro Met Ala Glu Asn Ser Lys Phe Phe Lys Lys His Gly
            420                 425                 430

Ile Arg Asn Gly Ile Asn Pro Ala Met Tyr Gln Ser Pro Met Arg Leu
        435                 440                 445

Arg Ser Ser Thr Ile Gln Ser Ser Ser Ile Ile Leu Leu Asp Thr Leu
    450                 455                 460

Leu Leu Thr Glu Asn Glu Gly Asp Lys Thr Glu Glu Gln Val Ser Tyr
465                 470                 475                 480

Val
```

<210> 73
<211> 189
<212> PRT
<213> Homo sapiens

<400> 73

```
Met Ala Leu Ser Phe Ser Leu Leu Met Ala Val Leu Val Leu Ser Tyr
1               5                   10                  15

Lys Ser Ile Cys Ser Leu Gly Cys Asp Leu Pro Gln Thr His Ser Leu
            20                  25                  30

Gly Asn Arg Arg Ala Leu Ile Leu Leu Ala Gln Met Gly Arg Ile Ser
        35                  40                  45

Pro Phe Ser Cys Leu Lys Asp Arg His Asp Phe Gly Phe Pro Gln Glu
    50                  55                  60

Glu Phe Asp Gly Asn Gln Phe Gln Lys Ala Gln Ala Ile Ser Val Leu
65                  70                  75                  80

His Glu Met Ile Gln Gln Thr Phe Asn Leu Phe Ser Thr Lys Asp Ser
                85                  90                  95

Ser Ala Thr Trp Glu Gln Ser Leu Leu Glu Lys Phe Ser Thr Glu Leu
            100                 105                 110

Asn Gln Gln Leu Asn Asp Met Glu Ala Cys Val Ile Gln Glu Val Gly
        115                 120                 125

Val Glu Glu Thr Pro Leu Met Asn Val Asp Ser Ile Leu Ala Val Lys
    130                 135                 140

Lys Tyr Phe Gln Arg Ile Thr Leu Tyr Leu Thr Glu Lys Lys Tyr Ser
145                 150                 155                 160
```

```
Pro Cys Ala Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser
                165                 170                 175

Leu Ser Lys Ile Phe Gln Glu Arg Leu Arg Arg Lys Glu
            180                 185

<210>  74
<211>  153
<212>  PRT
<213>  Homo sapiens

<400>  74

Met Gly Lys Ile Ser Ser Leu Pro Thr Gln Leu Phe Lys Cys Cys Phe
1               5                   10                  15

Cys Asp Phe Leu Lys Val Lys Met His Thr Met Ser Ser Ser His Leu
            20                  25                  30

Phe Tyr Leu Ala Leu Cys Leu Leu Thr Phe Thr Ser Ser Ala Thr Ala
        35                  40                  45

Gly Pro Glu Thr Leu Cys Gly Ala Glu Leu Val Asp Ala Leu Gln Phe
    50                  55                  60

Val Cys Gly Asp Arg Gly Phe Tyr Phe Asn Lys Pro Thr Gly Tyr Gly
65                  70                  75                  80

Ser Ser Ser Arg Arg Ala Pro Gln Thr Gly Ile Val Asp Glu Cys Cys
                85                  90                  95

Phe Arg Ser Cys Asp Leu Arg Arg Leu Glu Met Tyr Cys Ala Pro Leu
            100                 105                 110

Lys Pro Ala Lys Ser Ala Arg Ser Val Arg Ala Gln Arg His Thr Asp
        115                 120                 125

Met Pro Lys Thr Gln Lys Glu Val His Leu Lys Asn Ala Ser Arg Gly
    130                 135                 140

Ser Ala Gly Asn Lys Asn Tyr Arg Met
145                 150

<210>  75
<211>  632
<212>  PRT
<213>  Homo sapiens

<220>
<221>  UNSURE
<222>  (199)..(199)
<223>  Xaa = any amino acid


<400>  75

Met Glu Thr Pro Ala Ala Ala Ala Pro Ala Gly Ser Leu Phe Pro Ser
1               5                   10                  15
```

```
Phe Leu Leu Leu Ala Cys Gly Thr Leu Val Ala Ala Leu Leu Gly Ala
            20                  25                  30

Ala His Arg Leu Gly Leu Phe Tyr Gln Leu Leu His Lys Val Asp Lys
        35                  40                  45

Ala Ser Val Arg His Gly Gly Glu Asn Val Ala Ala Val Leu Arg Ala
    50                  55                  60

His Gly Val Arg Phe Ile Phe Thr Leu Val Gly Gly His Ile Ser Pro
65                  70                  75                  80

Leu Leu Val Ala Cys Glu Lys Leu Gly Ile Arg Val Val Asp Thr Arg
                85                  90                  95

His Glu Val Thr Ala Val Phe Ala Ala Asp Ala Met Ala Arg Leu Ser
            100                 105                 110

Gly Thr Val Gly Val Ala Ala Val Thr Ala Gly Pro Gly Leu Thr Asn
        115                 120                 125

Thr Val Thr Ala Val Lys Asn Ala Gln Met Ala Gln Ser Pro Ile Leu
    130                 135                 140

Leu Leu Gly Gly Ala Ala Ser Thr Leu Leu Gln Asn Arg Gly Ala Leu
145                 150                 155                 160

Gln Ala Val Asp Gln Leu Ser Leu Phe Arg Pro Leu Cys Lys Phe Cys
                165                 170                 175

Val Ser Val Arg Arg Val Arg Asp Ile Val Pro Thr Leu Arg Ala Ala
            180                 185                 190

Met Ala Ala Ala Gln Ser Xaa Thr Pro Gly Pro Val Phe Val Glu Leu
        195                 200                 205

Pro Val Asp Val Leu Tyr Pro Tyr Phe Met Val Gln Lys Glu Met Val
    210                 215                 220

Pro Ala Lys Pro Pro Lys Gly Leu Val Gly Arg Val Val Ser Trp Tyr
225                 230                 235                 240

Leu Glu Asn Tyr Leu Ala Asn Leu Phe Ala Gly Ala Trp Glu Pro Gln
                245                 250                 255

Pro Glu Gly Pro Leu Pro Leu Asp Ile Pro Gln Ala Ser Pro Gln Gln
            260                 265                 270

Val Gln Arg Cys Val Glu Ile Leu Ser Arg Ala Lys Arg Pro Leu Met
        275                 280                 285

Val Leu Gly Ser Gln Ala Leu Leu Thr Pro Thr Ser Ala Asp Lys Leu
    290                 295                 300

Arg Ala Ala Val Glu Thr Leu Gly Val Pro Cys Phe Leu Gly Gly Met
305                 310                 315                 320

Ala Arg Gly Leu Leu Gly Arg Asn His Pro Leu His Ile Arg Glu Asn
                325                 330                 335
```

```
Arg Ser Ala Ala Leu Lys Lys Ala Asp Val Ile Val Leu Ala Gly Thr
            340                 345                 350

Val Cys Asp Phe Arg Leu Ser Tyr Gly Arg Val Leu Ser His Ser Ser
        355                 360                 365

Lys Ile Ile Ile Val Asn Arg Asn Arg Glu Glu Met Leu Leu Asn Ser
    370                 375                 380

Asp Ile Phe Trp Lys Pro Gln Glu Ala Val Gln Gly Asp Val Gly Ser
385                 390                 395                 400

Phe Val Leu Lys Leu Val Glu Gly Leu Gln Gly Gln Thr Trp Ala Pro
                405                 410                 415

Asp Trp Val Glu Glu Leu Arg Glu Ala Asp Arg Gln Lys Glu Gln Thr
            420                 425                 430

Phe Arg Glu Lys Ala Ala Met Pro Val Ala Gln His Leu Asn Pro Val
        435                 440                 445

Gln Val Leu Gln Leu Val Glu Glu Thr Leu Pro Asp Asn Ser Ile Leu
    450                 455                 460

Val Val Asp Gly Gly Asp Phe Val Gly Thr Ala Ala His Leu Val Gln
465                 470                 475                 480

Pro Arg Gly Pro Leu Arg Trp Leu Asp Pro Gly Ala Phe Gly Thr Leu
                485                 490                 495

Gly Val Gly Ala Gly Phe Ala Leu Gly Ala Lys Leu Cys Arg Pro Asp
            500                 505                 510

Ala Glu Val Trp Cys Leu Phe Gly Asp Gly Ala Phe Gly Tyr Ser Leu
        515                 520                 525

Ile Glu Phe Asp Thr Phe Val Arg His Lys Ile Pro Val Met Ala Leu
    530                 535                 540

Val Gly Asn Asp Ala Gly Trp Thr Gln Ile Ser Arg Glu Gln Val Pro
545                 550                 555                 560

Ser Leu Gly Ser Asn Val Ala Cys Gly Leu Ala Tyr Thr Asp Tyr His
                565                 570                 575

Lys Ala Ala Met Gly Leu Gly Ala Arg Gly Leu Leu Leu Ser Arg Glu
            580                 585                 590

Asn Glu Asp Gln Val Val Lys Val Leu His Asp Ala Gln Gln Gln Cys
        595                 600                 605

Arg Asp Gly His Pro Val Val Val Asn Ile Leu Ile Gly Arg Thr Asp
    610                 615                 620

Phe Arg Asp Gly Ser Ile Ala Val
625                 630
```

<210> 76
<211> 349
<212> PRT

<213> Homo sapiens

<400> 76

```
Met Pro Val Glu Arg Met Arg Met Arg Pro Trp Leu Glu Glu Gln Ile
1               5                  10                  15

Asn Ser Asn Thr Ile Pro Gly Leu Lys Trp Leu Asn Lys Glu Lys Lys
            20                  25                  30

Ile Phe Gln Ile Pro Trp Met His Ala Ala Arg His Gly Trp Asp Val
        35                  40                  45

Glu Lys Asp Ala Pro Leu Phe Arg Asn Arg Ala Ile His Thr Gly Lys
    50                  55                  60

His Gln Pro Gly Val Asp Lys Pro Asp Pro Lys Thr Trp Lys Ala Asn
65                  70                  75                  80

Phe Arg Cys Ala Met Asn Ser Leu Pro Asp Ile Glu Glu Val Lys Asp
                85                  90                  95

Lys Ser Ile Lys Lys Gly Asn Asn Ala Phe Arg Val Tyr Arg Met Leu
            100                 105                 110

Pro Leu Ser Glu Arg Pro Ser Lys Lys Gly Lys Lys Pro Lys Thr Glu
        115                 120                 125

Lys Glu Asp Lys Val Lys His Ile Lys Gln Glu Pro Val Glu Ser Ser
    130                 135                 140

Leu Gly Leu Ser Asn Gly Val Ser Asp Leu Ser Pro Glu Tyr Ala Val
145                 150                 155                 160

Leu Thr Ser Thr Ile Lys Asn Glu Val Asp Ser Thr Val Asn Ile Ile
                165                 170                 175

Val Val Gly Gln Ser His Leu Asp Ser Asn Ile Glu Asn Gln Glu Ile
            180                 185                 190

Val Thr Asn Pro Pro Asp Ile Cys Gln Val Val Glu Val Thr Thr Glu
        195                 200                 205

Ser Asp Glu Gln Pro Val Ser Met Ser Glu Leu Tyr Pro Leu Gln Ile
    210                 215                 220

Ser Pro Val Ser Ser Tyr Ala Glu Ser Glu Thr Thr Asp Ser Val Pro
225                 230                 235                 240

Ser Asp Glu Glu Ser Ala Glu Gly Arg Pro His Trp Arg Lys Arg Asn
                245                 250                 255

Ile Glu Gly Lys Gln Tyr Leu Ser Asn Met Gly Thr Arg Gly Ser Tyr
            260                 265                 270

Leu Leu Pro Gly Met Ala Ser Phe Val Thr Ser Asn Lys Pro Asp Leu
        275                 280                 285

Gln Val Thr Ile Lys Glu Glu Ser Asn Pro Val Pro Tyr Asn Ser Ser
    290                 295                 300
```

Trp Pro Pro Phe Gln Asp Leu Pro Leu Ser Ser Ser Met Thr Pro Ala
305 310 315 320

Ser Ser Ser Ser Arg Pro Asp Arg Glu Thr Arg Ala Ser Val Ile Lys
325 330 335

Lys Thr Ser Asp Ile Thr Gln Ala Arg Val Lys Ser Cys
340 345

<210> 77
<211> 338
<212> PRT
<213> Homo sapiens

<400> 77

Met Ile Asn Ser Thr Ser Thr Gln Pro Pro Asp Glu Ser Cys Ser Gln
1 5 10 15

Asn Leu Leu Ile Thr Gln Gln Ile Ile Pro Val Leu Tyr Cys Met Val
20 25 30

Phe Ile Ala Gly Ile Leu Leu Asn Gly Val Ser Gly Trp Ile Phe Phe
35 40 45

Tyr Val Pro Ser Ser Lys Ser Phe Ile Ile Tyr Leu Lys Asn Ile Val
50 55 60

Ile Ala Asp Phe Val Met Ser Leu Thr Phe Pro Phe Lys Ile Leu Gly
65 70 75 80

Asp Ser Gly Leu Gly Pro Trp Gln Leu Asn Val Phe Val Cys Arg Val
85 90 95

Ser Ala Val Leu Phe Tyr Val Asn Met Tyr Val Ser Ile Val Phe Phe
100 105 110

Gly Leu Ile Ser Phe Asp Arg Tyr Tyr Lys Ile Val Lys Pro Leu Trp
115 120 125

Thr Ser Phe Ile Gln Ser Val Ser Tyr Ser Lys Leu Leu Ser Val Ile
130 135 140

Val Trp Met Leu Met Leu Leu Leu Ala Val Pro Asn Ile Ile Leu Thr
145 150 155 160

Asn Gln Ser Val Arg Glu Val Thr Gln Ile Lys Cys Ile Glu Leu Lys
165 170 175

Ser Glu Leu Gly Arg Lys Trp His Lys Ala Ser Asn Tyr Ile Phe Val
180 185 190

Ala Ile Phe Trp Ile Val Phe Leu Leu Leu Ile Val Phe Tyr Thr Ala
195 200 205

Ile Thr Lys Lys Ile Phe Lys Ser His Leu Lys Ser Ser Arg Asn Ser
210 215 220

Thr Ser Val Lys Lys Lys Ser Ser Arg Asn Ile Phe Ser Ile Val Phe

225 230 235 240

Val Phe Phe Val Cys Phe Val Pro Tyr His Ile Ala Arg Ile Pro Tyr
245 250 255

Thr Lys Ser Gln Thr Glu Ala His Tyr Ser Cys Gln Ser Lys Glu Ile
260 265 270

Leu Arg Tyr Met Lys Glu Phe Thr Leu Leu Leu Ser Ala Ala Asn Val
275 280 285

Cys Leu Asp Pro Ile Ile Tyr Phe Phe Leu Cys Gln Pro Phe Arg Glu
290 295 300

Ile Leu Cys Lys Lys Leu His Ile Pro Leu Lys Ala Gln Asn Asp Leu
305 310 315 320

Asp Ile Ser Arg Ile Lys Arg Gly Asn Thr Thr Leu Glu Ser Thr Asp
325 330 335

Thr Leu

<210> 78
<211> 232
<212> PRT
<213> Homo sapiens

<400> 78

Leu Glu Thr Gln Ile Glu Ala Leu Lys Glu Glu Leu Leu Phe Met Lys
1 5 10 15

Lys Asn His Glu Glu Glu Val Lys Gly Leu Gln Ala Gln Ile Ala Ser
20 25 30

Ser Gly Leu Thr Val Glu Val Asp Ala Pro Lys Ser Gln Asp Leu Ser
35 40 45

Lys Ile Met Ala Asp Ile Arg Ala Gln Tyr Asp Glu Leu Ala Arg Lys
50 55 60

Asn Arg Glu Glu Leu Asp Lys Tyr Trp Ser Gln Gln Ile Glu Glu Ser
65 70 75 80

Thr Thr Val Val Thr Thr Gln Ser Ala Glu Val Gly Ala Ala Glu Thr
85 90 95

Thr Leu Thr Glu Leu Arg Arg Thr Val Gln Ser Leu Glu Ile Arg Leu
100 105 110

Asp Arg Met Arg Asn Leu Lys Ala Ser Leu Glu Asn Ser Leu Arg Glu
115 120 125

Val Glu Ala Arg Tyr Ala Leu Gln Met Glu Gln Leu Asn Gly Ile Leu
130 135 140

Leu His Leu Glu Ser Glu Leu Ala Gln Thr Arg Ala Glu Gly Gln Arg
145 150 155 160

```
Gln Ala Gln Glu Tyr Glu Ala Leu Leu Asn Ile Lys Val Lys Leu Glu
                165                 170                 175

Ala Glu Ile Ala Thr Tyr Arg Arg Leu Leu Glu Asp Gly Glu Asp Phe
            180                 185                 190

Asn Leu Gly Asp Ala Leu Asp Ser Ser Asn Ser Met Gln Thr Ile Gln
        195                 200                 205

Lys Thr Thr Thr Arg Arg Ile Val Asp Gly Lys Val Val Ser Glu Thr
    210                 215                 220

Asn Asp Thr Lys Val Leu Arg His
225                 230
```

<210> 79
<211> 483
<212> PRT
<213> Homo sapiens

<400> 79

```
Met Ser Ile Arg Val Thr Gln Lys Ser Tyr Lys Val Ser Thr Ser Gly
1               5                   10                  15

Pro Arg Ala Phe Ser Ser Arg Ser Tyr Thr Ser Gly Pro Gly Ser Arg
            20                  25                  30

Ile Ser Ser Ser Ser Phe Ser Arg Val Gly Ser Ser Asn Phe Arg Gly
        35                  40                  45

Gly Leu Gly Gly Gly Tyr Gly Gly Ala Ser Gly Met Gly Gly Ile Thr
    50                  55                  60

Ala Val Thr Val Asn Gln Ser Leu Leu Ser Pro Leu Val Leu Glu Val
65                  70                  75                  80

Asp Pro Asn Ile Gln Ala Val Arg Thr Gln Glu Lys Glu Gln Ile Lys
                85                  90                  95

Thr Leu Asn Asn Lys Phe Ala Ser Phe Ile Asp Lys Val Arg Phe Leu
            100                 105                 110

Glu Gln Gln Asn Lys Met Leu Glu Thr Lys Trp Ser Leu Leu Gln Gln
        115                 120                 125

Gln Lys Thr Ala Arg Ser Asn Met Asp Asn Met Phe Glu Ser Tyr Ile
    130                 135                 140

Asn Asn Leu Arg Arg Gln Leu Glu Thr Leu Gly Gln Glu Lys Leu Lys
145                 150                 155                 160

Leu Glu Ala Glu Leu Gly Asn Met Gln Gly Leu Val Glu Asp Phe Lys
                165                 170                 175

Asn Lys Tyr Glu Asp Glu Ile Asn Lys Arg Thr Glu Met Glu Asn Glu
            180                 185                 190

Phe Val Leu Ile Lys Lys Asp Val Asp Glu Ala Tyr Met Asn Lys Val
        195                 200                 205
```

```
Glu Leu Glu Ser Arg Leu Glu Gly Leu Thr Asp Glu Ile Asn Phe Leu
    210                 215                 220

Arg Gln Leu Tyr Glu Glu Glu Ile Arg Glu Leu Gln Ser Gln Ile Ser
225                 230                 235                 240

Asp Thr Ser Val Val Leu Ser Met Asp Asn Ser Arg Ser Leu Asp Met
                245                 250                 255

Asp Ser Ile Ile Ala Glu Val Lys Ala Gln Tyr Glu Asp Ile Ala Asn
            260                 265                 270

Arg Ser Arg Ala Glu Ala Glu Ser Met Tyr Gln Ile Lys Tyr Glu Glu
        275                 280                 285

Leu Gln Ser Leu Ala Gly Lys His Gly Asp Asp Leu Arg Arg Thr Lys
    290                 295                 300

Thr Glu Ile Ser Glu Met Asn Arg Asn Ile Ser Arg Leu Gln Ala Glu
305                 310                 315                 320

Ile Glu Gly Leu Lys Gly Gln Arg Ala Ser Leu Glu Ala Ala Ile Ala
                325                 330                 335

Asp Ala Glu Gln Arg Gly Glu Leu Ala Ile Lys Asp Ala Asn Ala Lys
            340                 345                 350

Leu Ser Glu Leu Glu Ala Ala Leu Gln Arg Ala Lys Gln Asp Met Ala
        355                 360                 365

Arg Gln Leu Arg Glu Tyr Gln Glu Leu Met Asn Val Lys Leu Ala Leu
    370                 375                 380

Asp Ile Glu Ile Ala Thr Tyr Arg Lys Leu Leu Glu Gly Glu Glu Ser
385                 390                 395                 400

Arg Leu Glu Ser Gly Met Gln Asn Met Ser Ile His Thr Lys Thr Thr
                405                 410                 415

Ser Gly Tyr Ala Gly Gly Leu Ser Ser Ala Tyr Gly Gly Leu Thr Ser
            420                 425                 430

Pro Gly Leu Ser Tyr Ser Leu Gly Ser Ser Phe Gly Ser Gly Ala Gly
        435                 440                 445

Ser Ser Ser Phe Ser Arg Thr Ser Ser Ser Arg Ala Val Val Val Lys
    450                 455                 460

Lys Ile Glu Thr Arg Asp Gly Lys Leu Val Ser Glu Ser Ser Asp Val
465                 470                 475                 480

Leu Pro Lys
```

<210> 80
<211> 440
<212> PRT
<213> Homo sapiens

<400> 80

```
Met Gly Pro Pro Gly Ser Pro Trp Gln Trp Val Thr Leu Leu Leu Gly
1               5                  10                  15

Leu Leu Leu Pro Pro Ala Ala Pro Phe Trp Leu Leu Asn Val Leu Phe
            20                  25                  30

Pro Pro His Thr Thr Pro Lys Ala Glu Leu Ser Asn His Thr Arg Pro
        35                  40                  45

Val Ile Leu Val Pro Gly Cys Leu Gly Asn Gln Leu Glu Ala Lys Leu
    50                  55                  60

Asp Lys Pro Asp Val Val Asn Trp Met Cys Tyr Arg Lys Thr Glu Asp
65                  70                  75                  80

Phe Phe Thr Ile Trp Leu Asp Leu Asn Met Phe Leu Pro Leu Gly Val
                85                  90                  95

Asp Cys Trp Ile Asp Asn Thr Arg Val Val Tyr Asn Arg Ser Ser Gly
            100                 105                 110

Leu Val Ser Asn Ala Pro Gly Val Gln Ile Arg Val Pro Gly Phe Gly
        115                 120                 125

Lys Thr Tyr Ser Val Glu Tyr Leu Asp Ser Ser Lys Leu Ala Gly Tyr
    130                 135                 140

Leu His Thr Leu Val Gln Asn Leu Val Asn Asn Gly Tyr Val Arg Asp
145                 150                 155                 160

Glu Thr Val Arg Ala Ala Pro Tyr Asp Trp Arg Leu Glu Pro Gly Gln
                165                 170                 175

Gln Glu Glu Tyr Tyr Arg Lys Leu Ala Gly Leu Val Glu Glu Met His
            180                 185                 190

Ala Ala Tyr Gly Lys Pro Val Phe Leu Ile Gly His Ser Leu Gly Cys
        195                 200                 205

Leu His Leu Leu Tyr Phe Leu Leu Arg Gln Pro Gln Ala Trp Lys Asp
    210                 215                 220

Arg Phe Ile Asp Gly Phe Ile Ser Leu Gly Ala Pro Trp Gly Gly Ser
225                 230                 235                 240

Ile Lys Pro Met Leu Val Leu Ala Ser Gly Asp Asn Gln Gly Ile Pro
                245                 250                 255

Ile Met Ser Ser Ile Lys Leu Lys Glu Glu Gln Arg Ile Thr Thr Thr
            260                 265                 270

Ser Pro Trp Met Phe Pro Ser Arg Met Ala Trp Pro Glu Asp His Val
        275                 280                 285

Phe Ile Ser Thr Pro Ser Phe Asn Tyr Thr Gly Arg Asp Phe Gln Arg
    290                 295                 300

Phe Phe Ala Asp Leu His Phe Glu Glu Gly Trp Tyr Met Trp Leu Gln
```

305 310 315 320

Ser Arg Asp Leu Leu Ala Gly Leu Pro Ala Pro Gly Val Glu Val Tyr
325 330 335

Cys Leu Tyr Gly Val Gly Leu Pro Thr Pro Arg Thr Tyr Ile Tyr Asp
340 345 350

His Gly Phe Pro Tyr Thr Asp Pro Val Gly Val Leu Tyr Glu Asp Gly
355 360 365

Asp Asp Thr Val Ala Thr Arg Ser Thr Glu Leu Cys Gly Leu Trp Gln
370 375 380

Gly Arg Gln Pro Gln Pro Val His Leu Leu Pro Leu His Gly Ile Gln
385 390 395 400

His Leu Asn Met Val Phe Ser Asn Leu Thr Leu Glu His Ile Asn Ala
405 410 415

Ile Leu Leu Gly Ala Tyr Arg Gln Gly Pro Pro Ala Ser Pro Thr Ala
420 425 430

Ser Pro Glu Pro Pro Pro Pro Glu
435 440

<210> 81
<211> 135
<212> PRT
<213> Homo sapiens

<400> 81

Met Ala Cys Gly Leu Val Ala Ser Asn Leu Asn Leu Lys Pro Gly Glu
1 5 10 15

Cys Leu Arg Val Arg Gly Glu Val Ala Pro Asp Ala Lys Ser Phe Val
20 25 30

Leu Asn Leu Gly Lys Asp Ser Asn Asn Leu Cys Leu His Phe Asn Pro
35 40 45

Arg Phe Asn Ala His Gly Asp Ala Asn Thr Ile Val Cys Asn Ser Lys
50 55 60

Asp Gly Gly Ala Trp Gly Thr Glu Gln Arg Glu Ala Val Phe Pro Phe
65 70 75 80

Gln Pro Gly Ser Val Ala Glu Val Cys Ile Thr Phe Asp Gln Ala Asn
85 90 95

Leu Thr Val Lys Leu Pro Asp Gly Tyr Glu Phe Lys Phe Pro Asn Arg
100 105 110

Leu Asn Leu Glu Ala Ile Asn Tyr Met Ala Ala Asp Gly Asp Phe Lys
115 120 125

Ile Lys Cys Val Ala Phe Asp
130 135

<210> 82
<211> 314
<212> PRT
<213> Homo sapiens

<400> 82

Met Ala Pro Pro Gln Val Leu Ala Phe Gly Leu Leu Leu Ala Ala Ala
1 5 10 15

Thr Ala Thr Phe Ala Ala Ala Gln Glu Glu Cys Val Cys Glu Asn Tyr
20 25 30

Lys Leu Ala Val Asn Cys Phe Val Asn Asn Asn Arg Gln Cys Gln Cys
35 40 45

Thr Ser Val Gly Ala Gln Asn Thr Val Ile Cys Ser Lys Leu Ala Ala
50 55 60

Lys Cys Leu Val Met Lys Ala Glu Met Asn Gly Ser Lys Leu Gly Arg
65 70 75 80

Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn Asn Asp Gly Leu Tyr Asp
85 90 95

Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys Ala Lys Gln Cys Asn Gly
100 105 110

Thr Ser Thr Cys Trp Cys Val Asn Thr Ala Gly Val Arg Arg Thr Asp
115 120 125

Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg Val Arg Thr Tyr Trp Ile
130 135 140

Ile Ile Glu Leu Lys His Lys Ala Arg Glu Lys Pro Tyr Asp Ser Lys
145 150 155 160

Ser Leu Arg Thr Ala Leu Gln Lys Glu Ile Thr Thr Arg Tyr Gln Leu
165 170 175

Asp Pro Lys Phe Ile Thr Ser Ile Leu Tyr Glu Asn Asn Val Ile Thr
180 185 190

Ile Asp Leu Val Gln Asn Ser Ser Gln Lys Thr Gln Asn Asp Val Asp
195 200 205

Ile Ala Asp Val Ala Tyr Tyr Phe Glu Lys Asp Val Lys Gly Glu Ser
210 215 220

Leu Phe His Ser Lys Lys Met Asp Leu Thr Val Asn Gly Glu Gln Leu
225 230 235 240

Asp Leu Asp Pro Gly Gln Thr Leu Ile Tyr Tyr Val Asp Glu Lys Ala
245 250 255

Pro Glu Phe Ser Met Gln Gly Leu Lys Ala Gly Val Ile Ala Val Ile
260 265 270

Val Val Val Val Ile Ala Val Val Ala Gly Ile Val Val Leu Val Ile
275 280 285

Ser Arg Lys Lys Arg Met Ala Lys Tyr Glu Lys Ala Glu Ile Lys Glu
290 295 300

Met Gly Glu Met His Arg Glu Leu Asn Ala
305 310

<210> 83
<211> 720
<212> PRT
<213> Homo sapiens

<400> 83

Lys Ser Val Trp Lys Gly Gly Leu Arg Glu Arg Asp Pro Arg Gly Thr
1 5 10 15

Arg Gly Gly Gly Arg Arg Gly Thr Gly Ser Gln Pro Ala Leu Cys Leu
20 25 30

Gly Ala Gly Arg Gln Glu Gly Ala Met Ala Leu Asp Gly Ile Arg Met
35 40 45

Pro Asp Gly Cys Tyr Ala Asp Gly Thr Trp Glu Leu Ser Val His Val
50 55 60

Thr Asp Leu Asn Arg Asp Ile Thr Leu Arg Val Thr Gly Glu Val His
65 70 75 80

Ile Gly Gly Val Met Leu Lys Leu Val Glu Lys Leu Asp Val Lys Lys
85 90 95

Asp Trp Ser Asp His Ala Leu Trp Trp Glu Lys Lys Arg Thr Trp Leu
100 105 110

Leu Lys Thr His Trp Thr Leu Asp Lys Tyr Gly Ile Gln Ala Asp Ala
115 120 125

Lys Leu Gln Phe Thr Pro Gln His Lys Leu Leu Arg Leu Gln Leu Pro
130 135 140

Asn Met Lys Tyr Val Lys Val Lys Val Asn Phe Ser Asp Arg Val Phe
145 150 155 160

Lys Ala Val Ser Asp Ile Cys Lys Thr Phe Asn Ile Arg His Pro Glu
165 170 175

Glu Leu Ser Leu Leu Lys Lys Pro Arg Asp Pro Thr Lys Lys Lys Lys
180 185 190

Lys Lys Leu Asp Asp Gln Ser Glu Asp Glu Ala Leu Glu Leu Glu Gly
195 200 205

Pro Leu Ile Thr Pro Gly Ser Gly Ser Ile Tyr Ser Ser Pro Gly Leu
210 215 220

Tyr Ser Lys Thr Met Thr Pro Thr Tyr Asp Ala His Asp Gly Ser Pro
225 230 235 240

Leu Ser Pro Thr Ser Ala Trp Phe Gly Asp Ser Ala Leu Ser Glu Gly

```
                245                 250                 255

Asn Pro Gly Ile Leu Ala Val Ser Gln Pro Ile Thr Ser Pro Glu Ile
            260                 265                 270

Leu Ala Lys Met Phe Lys Pro Gln Ala Leu Leu Asp Lys Ala Lys Ile
        275                 280                 285

Asn Gln Gly Trp Leu Asp Ser Ser Arg Ser Leu Met Glu Gln Asp Val
    290                 295                 300

Lys Glu Asn Glu Ala Leu Leu Leu Arg Phe Lys Tyr Tyr Ser Phe Phe
305                 310                 315                 320

Asp Leu Asn Pro Lys Tyr Asp Ala Ile Arg Ile Asn Gln Leu Tyr Glu
                325                 330                 335

Gln Ala Lys Trp Ala Ile Leu Leu Glu Glu Ile Glu Cys Thr Glu Glu
            340                 345                 350

Glu Met Met Met Phe Ala Ala Leu Gln Tyr His Ile Asn Lys Leu Ser
        355                 360                 365

Ile Met Thr Ser Glu Asn His Leu Asn Asn Ser Asp Lys Glu Val Asp
    370                 375                 380

Glu Val Asp Ala Ala Leu Ser Asp Leu Glu Ile Thr Leu Glu Gly Gly
385                 390                 395                 400

Lys Thr Ser Thr Ile Leu Gly Asp Ile Thr Ser Ile Pro Glu Leu Ala
                405                 410                 415

Asp Tyr Ile Lys Val Phe Lys Pro Lys Lys Leu Thr Leu Lys Gly Tyr
            420                 425                 430

Lys Gln Tyr Trp Cys Thr Phe Lys Asp Thr Ser Ile Ser Cys Tyr Lys
        435                 440                 445

Ser Lys Glu Glu Ser Ser Gly Thr Pro Ala His Gln Met Asn Leu Arg
    450                 455                 460

Gly Cys Glu Val Thr Pro Asp Val Asn Ile Ser Gly Gln Lys Phe Asn
465                 470                 475                 480

Ile Lys Leu Leu Ile Pro Val Ala Glu Gly Met Asn Glu Ile Trp Leu
                485                 490                 495

Arg Cys Asp Asn Glu Lys Gln Tyr Ala His Trp Met Ala Ala Cys Arg
            500                 505                 510

Leu Ala Ser Lys Gly Lys Thr Met Ala Asp Ser Ser Tyr Asn Leu Glu
        515                 520                 525

Val Gln Asn Ile Leu Ser Phe Leu Lys Met Gln His Leu Asn Pro Asp
    530                 535                 540

Pro Gln Leu Ile Pro Glu Gln Ile Thr Thr Asp Ile Thr Pro Glu Cys
545                 550                 555                 560

Leu Val Ser Pro Arg Tyr Leu Lys Lys Tyr Lys Asn Lys Gln Ile Thr
```

565 570 575

Ala Arg Ile Leu Glu Ala His Gln Asn Val Ala Gln Met Ser Leu Ile
580 585 590

Glu Ala Lys Met Arg Phe Ile Gln Ala Trp Gln Ser Leu Pro Glu Phe
595 600 605

Gly Ile Thr His Phe Ile Ala Arg Phe Gln Gly Gly Lys Lys Glu Glu
610 615 620

Leu Ile Gly Ile Ala Tyr Asn Arg Leu Ile Arg Met Asp Ala Ser Thr
625 630 635 640

Gly Asp Ala Ile Lys Thr Trp Arg Phe Ser Asn Met Lys Gln Trp Asn
645 650 655

Val Asn Trp Glu Ile Lys Met Val Thr Val Glu Phe Ala Asp Glu Val
660 665 670

Arg Leu Ser Phe Ile Cys Thr Glu Val Asp Cys Lys Val Val His Glu
675 680 685

Phe Ile Gly Gly Tyr Ile Phe Leu Ser Thr Arg Ala Lys Asp Gln Asn
690 695 700

Glu Ser Leu Asp Glu Glu Met Phe Tyr Lys Leu Thr Ser Gly Trp Val
705 710 715 720

<210> 84
<211> 582
<212> PRT
<213> Homo sapiens

<400> 84

Met Ser Pro Ala Pro Arg Pro Pro Arg Cys Leu Leu Leu Pro Leu Leu
1 5 10 15

Thr Leu Gly Thr Ala Leu Ala Ser Leu Gly Ser Ala Gln Ser Ser Ser
20 25 30

Phe Ser Pro Glu Ala Trp Leu Gln Gln Tyr Gly Tyr Leu Pro Pro Gly
35 40 45

Asp Leu Arg Thr His Thr Gln Arg Ser Pro Gln Ser Leu Ser Ala Ala
50 55 60

Ile Ala Ala Met Gln Lys Phe Tyr Gly Leu Gln Val Thr Gly Lys Ala
65 70 75 80

Asp Ala Asp Thr Met Lys Ala Met Arg Arg Pro Arg Cys Gly Val Pro
85 90 95

Asp Lys Phe Gly Ala Glu Ile Lys Ala Asn Val Arg Arg Lys Arg Tyr
100 105 110

Ala Ile Gln Gly Leu Lys Trp Gln His Asn Glu Ile Thr Phe Cys Ile
115 120 125

```
Gln Asn Tyr Thr Pro Lys Val Gly Glu Tyr Ala Thr Tyr Glu Ala Ile
    130                 135                 140

Arg Lys Ala Phe Arg Val Trp Glu Ser Ala Thr Pro Leu Arg Phe Arg
145                 150                 155                 160

Glu Val Pro Tyr Ala Tyr Ile Arg Glu Gly His Glu Lys Gln Ala Asp
                165                 170                 175

Ile Met Ile Phe Phe Ala Glu Gly Phe His Gly Asp Ser Thr Pro Phe
            180                 185                 190

Asp Gly Glu Gly Gly Phe Leu Ala His Ala Tyr Phe Pro Gly Pro Asn
        195                 200                 205

Ile Gly Gly Asp Thr His Phe Asp Ser Ala Glu Pro Trp Thr Val Arg
    210                 215                 220

Asn Glu Asp Leu Asn Gly Asn Asp Ile Phe Leu Val Ala Val His Glu
225                 230                 235                 240

Leu Gly His Ala Leu Gly Leu Glu His Ser Ser Asp Pro Ser Ala Ile
                245                 250                 255

Met Ala Pro Phe Tyr Gln Trp Met Asp Thr Glu Asn Phe Val Leu Pro
            260                 265                 270

Asp Asp Asp Arg Arg Gly Ile Gln Gln Leu Tyr Gly Gly Glu Ser Gly
        275                 280                 285

Phe Pro Thr Lys Met Pro Pro Gln Pro Arg Thr Thr Ser Arg Pro Ser
    290                 295                 300

Val Pro Asp Lys Pro Lys Asn Pro Thr Tyr Gly Pro Asn Ile Cys Asp
305                 310                 315                 320

Gly Asn Phe Asp Thr Val Ala Met Leu Arg Gly Glu Met Phe Val Phe
                325                 330                 335

Lys Glu Arg Trp Phe Trp Arg Val Arg Asn Asn Gln Val Met Asp Gly
            340                 345                 350

Tyr Pro Met Pro Ile Gly Gln Phe Trp Arg Gly Leu Pro Ala Ser Ile
        355                 360                 365

Asn Thr Ala Tyr Glu Arg Lys Asp Gly Lys Phe Val Phe Phe Lys Gly
    370                 375                 380

Asp Lys His Trp Val Phe Asp Glu Ala Ser Leu Glu Pro Gly Tyr Pro
385                 390                 395                 400

Lys His Ile Lys Glu Leu Gly Arg Gly Leu Pro Thr Asp Lys Ile Asp
                405                 410                 415

Ala Ala Leu Phe Trp Met Pro Asn Gly Lys Thr Tyr Phe Phe Arg Gly
            420                 425                 430

Asn Lys Tyr Tyr Arg Phe Asn Glu Glu Leu Arg Ala Val Asp Ser Glu
        435                 440                 445
```

```
Tyr Pro Lys Asn Ile Lys Val Trp Glu Gly Ile Pro Glu Ser Pro Arg
    450                 455                 460

Gly Ser Phe Met Gly Ser Asp Glu Val Phe Thr Tyr Phe Tyr Lys Gly
465                 470                 475                 480

Asn Lys Tyr Trp Lys Phe Asn Asn Gln Lys Leu Lys Val Glu Pro Gly
                485                 490                 495

Tyr Pro Lys Ser Ala Leu Arg Asp Trp Met Gly Cys Pro Ser Gly Gly
            500                 505                 510

Arg Pro Asp Glu Gly Thr Glu Glu Glu Thr Glu Val Ile Ile Ile Glu
        515                 520                 525

Val Asp Glu Glu Gly Gly Gly Ala Val Ser Ala Ala Ala Val Val Leu
    530                 535                 540

Pro Val Leu Leu Leu Leu Leu Val Leu Ala Val Gly Leu Ala Val Phe
545                 550                 555                 560

Phe Phe Arg Arg His Gly Thr Pro Arg Arg Leu Leu Tyr Cys Gln Arg
                565                 570                 575

Ser Leu Leu Asp Lys Val
            580

<210>  85
<211>  1246
<212>  PRT
<213>  Homo sapiens

<400>  85

Met Leu Ala Ser Ser Ser Arg Ile Arg Ala Ala Trp Thr Arg Ala Leu
1               5                   10                  15

Leu Leu Pro Leu Leu Leu Ala Gly Pro Val Gly Cys Leu Ser Arg Gln
            20                  25                  30

Glu Leu Phe Pro Phe Gly Pro Gly Gln Gly Asp Leu Glu Leu Glu Asp
        35                  40                  45

Gly Asp Asp Phe Val Ser Pro Ala Leu Glu Leu Ser Gly Ala Leu Arg
    50                  55                  60

Phe Tyr Asp Arg Ser Asp Ile Asp Ala Val Tyr Val Thr Thr Asn Gly
65                  70                  75                  80

Ile Ile Ala Thr Ser Glu Pro Pro Ala Lys Glu Ser His Pro Gly Leu
                85                  90                  95

Phe Pro Pro Thr Phe Gly Ala Val Ala Pro Phe Leu Ala Asp Leu Asp
            100                 105                 110

Thr Thr Asp Gly Leu Gly Lys Val Tyr Tyr Arg Glu Asp Leu Ser Pro
        115                 120                 125

Ser Ile Thr Gln Arg Ala Ala Glu Cys Val His Arg Gly Phe Pro Glu
    130                 135                 140
```

```
Ile Ser Phe Gln Pro Ser Ser Ala Val Val Val Thr Trp Glu Ser Val
145                 150                 155                 160

Ala Pro Tyr Gln Gly Pro Ser Arg Asp Pro Asp Gln Lys Gly Lys Arg
                165                 170                 175

Asn Thr Phe Gln Ala Val Leu Ala Ser Ser Asp Ser Ser Ser Tyr Ala
            180                 185                 190

Ile Phe Leu Tyr Pro Glu Asp Gly Leu Gln Phe His Thr Thr Phe Ser
        195                 200                 205

Lys Lys Glu Asn Asn Gln Val Pro Ala Val Val Ala Phe Ser Gln Gly
    210                 215                 220

Ser Val Gly Phe Leu Trp Lys Ser Asn Gly Ala Tyr Asn Ile Phe Ala
225                 230                 235                 240

Asn Asp Arg Glu Ser Ile Glu Asn Leu Ala Lys Ser Ser Asn Ser Gly
                245                 250                 255

Gln Gln Gly Val Trp Val Phe Glu Ile Gly Ser Pro Ala Thr Thr Asn
            260                 265                 270

Gly Val Val Pro Ala Asp Val Ile Leu Gly Thr Glu Asp Gly Ala Glu
        275                 280                 285

Tyr Asp Asp Glu Asp Glu Asp Tyr Asp Leu Ala Thr Thr Arg Leu Gly
    290                 295                 300

Leu Glu Asp Val Gly Thr Thr Pro Phe Ser Tyr Lys Ala Leu Arg Arg
305                 310                 315                 320

Gly Gly Ala Asp Thr Tyr Ser Val Pro Ser Val Leu Ser Pro Arg Arg
                325                 330                 335

Ala Ala Thr Glu Arg Pro Leu Gly Pro Pro Thr Glu Arg Thr Arg Ser
            340                 345                 350

Phe Gln Leu Ala Val Glu Thr Phe His Gln Gln His Pro Gln Val Ile
        355                 360                 365

Asp Val Asp Glu Val Glu Glu Thr Gly Val Val Phe Ser Tyr Asn Thr
    370                 375                 380

Asp Ser Arg Gln Thr Cys Ala Asn Asn Arg His Gln Cys Ser Val His
385                 390                 395                 400

Ala Glu Cys Arg Asp Tyr Ala Thr Gly Phe Cys Cys Ser Cys Val Ala
                405                 410                 415

Gly Tyr Thr Gly Asn Gly Arg Gln Cys Val Ala Glu Gly Ser Pro Gln
            420                 425                 430

Arg Val Asn Gly Lys Val Lys Gly Arg Ile Phe Val Gly Ser Ser Gln
        435                 440                 445

Val Pro Ile Val Phe Glu Asn Thr Asp Leu His Ser Tyr Val Val Met
    450                 455                 460
```

```
Asn His Gly Arg Ser Tyr Thr Ala Ile Ser Thr Ile Pro Glu Thr Val
465                 470                 475                 480

Gly Tyr Ser Leu Leu Pro Leu Ala Pro Val Gly Gly Ile Ile Gly Trp
                485                 490                 495

Met Phe Ala Val Glu Gln Asp Gly Phe Lys Asn Gly Phe Ser Ile Thr
            500                 505                 510

Gly Gly Glu Phe Thr Arg Gln Ala Glu Val Thr Phe Val Gly His Pro
        515                 520                 525

Gly Asn Leu Val Ile Lys Gln Arg Phe Ser Gly Ile Asp Glu His Gly
    530                 535                 540

His Leu Thr Ile Asp Thr Glu Leu Glu Gly Arg Val Pro Gln Ile Pro
545                 550                 555                 560

Phe Gly Ser Ser Val His Ile Glu Pro Tyr Thr Glu Leu Tyr His Tyr
                565                 570                 575

Ser Thr Ser Val Ile Thr Ser Ser Ser Thr Arg Glu Tyr Thr Val Thr
            580                 585                 590

Glu Pro Glu Arg Asp Gly Ala Ser Pro Ser Arg Ile Tyr Thr Tyr Gln
        595                 600                 605

Trp Arg Gln Thr Ile Thr Phe Gln Glu Cys Val His Asp Asp Ser Arg
    610                 615                 620

Pro Ala Leu Pro Ser Thr Gln Gln Leu Ser Val Asp Ser Val Phe Val
625                 630                 635                 640

Leu Tyr Asn Gln Glu Glu Lys Ile Leu Arg Tyr Ala Phe Ser Asn Ser
                645                 650                 655

Ile Gly Pro Val Arg Glu Gly Ser Pro Asp Ala Leu Gln Asn Pro Cys
            660                 665                 670

Tyr Ile Gly Thr His Gly Cys Asp Thr Asn Ala Ala Cys Arg Pro Gly
        675                 680                 685

Pro Arg Thr Gln Phe Thr Cys Glu Cys Ser Ile Gly Phe Arg Gly Asp
    690                 695                 700

Gly Arg Thr Cys Tyr Asp Ile Asp Glu Cys Ser Glu Gln Pro Ser Val
705                 710                 715                 720

Cys Gly Ser His Thr Ile Cys Asn Asn His Pro Gly Thr Phe Arg Cys
                725                 730                 735

Glu Cys Val Glu Gly Tyr Gln Phe Ser Asp Glu Gly Thr Cys Val Ala
            740                 745                 750

Val Val Asp Gln Arg Pro Ile Asn Tyr Cys Glu Thr Gly Leu His Asn
        755                 760                 765

Cys Asp Ile Pro Gln Arg Ala Gln Cys Ile Tyr Thr Gly Gly Ser Ser
    770                 775                 780
```

```
Tyr Thr Cys Ser Cys Leu Pro Gly Phe Ser Gly Asp Gly Gln Ala Cys
785                 790                 795                 800

Gln Asp Val Asp Glu Cys Gln Pro Ser Arg Cys His Pro Asp Ala Phe
                805                 810                 815

Cys Tyr Asn Thr Pro Gly Ser Phe Thr Cys Gln Cys Lys Pro Gly Tyr
            820                 825                 830

Gln Gly Asp Gly Phe Arg Cys Val Pro Gly Glu Val Glu Lys Thr Arg
        835                 840                 845

Cys Gln His Glu Arg Glu His Ile Leu Gly Ala Ala Gly Ala Thr Asp
    850                 855                 860

Pro Gln Arg Pro Ile Pro Pro Gly Leu Phe Val Pro Glu Cys Asp Ala
865                 870                 875                 880

His Gly His Tyr Ala Pro Thr Gln Cys His Gly Ser Thr Gly Tyr Cys
                885                 890                 895

Trp Cys Val Asp Arg Asp Gly Arg Glu Val Glu Gly Thr Arg Thr Arg
            900                 905                 910

Pro Gly Met Thr Pro Pro Cys Leu Ser Thr Val Ala Pro Pro Ile His
        915                 920                 925

Gln Gly Pro Ala Val Pro Thr Ala Val Ile Pro Leu Pro Pro Gly Thr
    930                 935                 940

His Leu Leu Phe Ala Gln Thr Gly Lys Ile Glu Arg Leu Pro Leu Glu
945                 950                 955                 960

Gly Asn Thr Met Arg Lys Thr Glu Ala Lys Ala Phe Leu His Val Pro
                965                 970                 975

Ala Lys Val Ile Ile Gly Leu Ala Phe Asp Cys Val Asp Lys Met Val
            980                 985                 990

Tyr Trp Thr Asp Ile Thr Glu Pro  Ser Ile Gly Arg Ala  Ser Leu His
        995                 1000                1005

Gly Gly  Glu Pro Thr Thr Ile  Ile Arg Gln Asp Leu  Gly Ser Pro
    1010                1015                1020

Glu Gly  Ile Ala Val Asp His  Leu Gly Arg Asn Ile  Phe Trp Thr
    1025                1030                1035

Asp Ser  Asn Leu Asp Arg Ile  Glu Val Ala Lys Leu  Asp Gly Thr
    1040                1045                1050

Gln Arg  Arg Val Leu Phe Glu  Thr Asp Leu Val Asn  Pro Arg Gly
    1055                1060                1065

Ile Val  Thr Asp Ser Val Arg  Gly Asn Leu Tyr Trp  Thr Asp Trp
    1070                1075                1080

Asn Arg  Asp Asn Pro Lys Ile  Glu Thr Ser Tyr Met  Asp Gly Thr
    1085                1090                1095
```

```
Asn Arg  Arg Ile Leu Val Gln  Asp Asp Leu Gly Leu  Pro Asn Gly
    1100                 1105                 1110

Leu His  Phe Asp Ala Phe Ser  Ser Gln Leu Cys Trp  Val Asp Ala
    1115                 1120                 1125

Gly Thr  Asn Arg Ala Glu Cys  Leu Asn Pro Ser Gln  Pro Ser Arg
    1130                 1135                 1140

Arg Lys  Ala Leu Glu Gly Leu  Gln Tyr Pro Phe Ala  Val Thr Ser
    1145                 1150                 1155

Tyr Gly  Lys Asn Leu Tyr Phe  Thr Asp Trp Lys Met  Asn Ser Val
    1160                 1165                 1170

Val Ala  Leu Asp Leu Ala Ile  Ser Lys Glu Thr Asp  Ala Phe Gln
    1175                 1180                 1185

Pro His  Lys Gln Thr Arg Leu  Tyr Gly Ile Thr Thr  Ala Leu Ser
    1190                 1195                 1200

Gln Cys  Pro Gln Gly His Asn  Tyr Cys Ser Val Asn  Asn Gly Gly
    1205                 1210                 1215

Cys Thr  His Leu Cys Leu Ala  Thr Pro Gly Ser Arg  Thr Cys Arg
    1220                 1225                 1230

Cys Pro  Asp Asn Thr Leu Gly  Val Asp Cys Ile Glu  Arg
    1235                 1240                 1245
```

<210> 86
<211> 423
<212> PRT
<213> Homo sapiens

<400> 86

```
Met Ala Met Val Val Ser Ser Trp Arg Asp Pro Gln Asp Asp Val Ala
1               5                  10                  15

Gly Gly Asn Pro Gly Gly Pro Asn Pro Ala Ala Gln Ala Ala Arg Gly
            20                  25                  30

Gly Gly Gly Gly Ala Gly Glu Gln Gln Gln Gln Ala Gly Ser Gly Ala
        35                  40                  45

Pro His Thr Pro Gln Thr Pro Gly Gln Pro Gly Ala Pro Ala Thr Pro
    50                  55                  60

Gly Thr Ala Gly Asp Lys Gly Gln Gly Pro Pro Gly Ser Gly Gln Ser
65                  70                  75                  80

Gln Gln His Ile Glu Cys Val Val Cys Gly Asp Lys Ser Ser Gly Lys
                85                  90                  95

His Tyr Gly Gln Phe Thr Cys Glu Gly Cys Lys Ser Phe Phe Lys Arg
            100                 105                 110

Ser Val Arg Arg Asn Leu Thr Tyr Thr Cys Arg Ala Asn Arg Asn Cys
```

```
        115                 120                 125

Pro Ile Asp Gln His His Arg Asn Gln Cys Gln Tyr Cys Arg Leu Lys
    130                 135                 140

Lys Cys Leu Lys Val Gly Met Arg Arg Glu Ala Val Gln Arg Gly Arg
145                 150                 155                 160

Met Pro Pro Thr Gln Pro Asn Pro Gly Gln Tyr Ala Leu Thr Asn Gly
                165                 170                 175

Asp Pro Leu Asn Gly His Cys Tyr Leu Ser Gly Tyr Ile Ser Leu Leu
            180                 185                 190

Leu Arg Ala Glu Pro Tyr Pro Thr Ser Arg Tyr Gly Ser Gln Cys Met
        195                 200                 205

Gln Pro Asn Asn Ile Met Gly Ile Glu Asn Ile Cys Glu Leu Ala Ala
    210                 215                 220

Arg Leu Leu Phe Ser Ala Val Glu Trp Ala Arg Asn Ile Pro Phe Phe
225                 230                 235                 240

Pro Asp Leu Gln Ile Thr Asp Gln Val Ser Leu Leu Arg Leu Thr Trp
                245                 250                 255

Ser Glu Leu Phe Val Leu Asn Ala Ala Gln Cys Ser Met Pro Leu His
            260                 265                 270

Val Ala Pro Leu Leu Ala Ala Ala Gly Leu His Ala Ser Pro Met Ser
        275                 280                 285

Ala Asp Arg Val Val Ala Phe Met Asp His Ile Arg Ile Phe Gln Glu
    290                 295                 300

Gln Val Glu Lys Leu Lys Ala Leu His Val Asp Ser Ala Glu Tyr Ser
305                 310                 315                 320

Cys Leu Lys Ala Ile Val Leu Phe Thr Ser Asp Ala Cys Gly Leu Ser
                325                 330                 335

Asp Ala Ala His Ile Glu Ser Leu Gln Glu Lys Ser Gln Cys Ala Leu
            340                 345                 350

Glu Glu Tyr Val Arg Ser Gln Tyr Pro Asn Gln Pro Ser Arg Phe Gly
        355                 360                 365

Lys Leu Leu Leu Arg Leu Pro Ser Leu Arg Thr Val Ser Ser Ser Val
    370                 375                 380

Ile Glu Gln Leu Phe Phe Val Arg Leu Val Gly Lys Thr Pro Ile Glu
385                 390                 395                 400

Thr Leu Ile Arg Asp Met Leu Leu Ser Gly Ser Ser Phe Asn Trp Pro
                405                 410                 415

Tyr Met Ser Ile Gln Cys Ser
            420
```

<210> 87

<211> 534
<212> PRT
<213> Homo sapiens

<400> 87

Met Ile Trp Tyr Ile Leu Ile Ile Gly Ile Leu Leu Pro Gln Ser Leu
1 5 10 15

Ala His Pro Gly Phe Phe Thr Ser Ile Gly Gln Met Thr Asp Leu Ile
20 25 30

His Thr Glu Lys Asp Leu Val Thr Ser Leu Lys Asp Tyr Ile Lys Ala
35 40 45

Glu Glu Asp Lys Leu Glu Gln Ile Lys Lys Trp Ala Glu Lys Leu Asp
50 55 60

Arg Leu Thr Ser Thr Ala Thr Lys Asp Pro Glu Gly Phe Val Gly His
65 70 75 80

Pro Val Asn Ala Phe Lys Leu Met Lys Arg Leu Asn Thr Glu Trp Ser
85 90 95

Glu Leu Glu Asn Leu Val Leu Lys Asp Met Ser Asp Gly Phe Ile Ser
100 105 110

Asn Leu Thr Ile Gln Arg Pro Val Leu Ser Asn Asp Glu Asp Gln Val
115 120 125

Gly Ala Ala Lys Ala Leu Leu Arg Leu Gln Asp Thr Tyr Asn Leu Asp
130 135 140

Thr Asp Thr Ile Ser Lys Gly Asn Leu Pro Gly Val Lys His Lys Ser
145 150 155 160

Phe Leu Thr Ala Glu Asp Cys Phe Glu Leu Gly Lys Val Ala Tyr Thr
165 170 175

Glu Ala Asp Tyr Tyr His Thr Glu Leu Trp Met Glu Gln Ala Leu Arg
180 185 190

Gln Leu Asp Glu Gly Glu Ile Ser Thr Ile Asp Lys Val Ser Val Leu
195 200 205

Asp Tyr Leu Ser Tyr Ala Val Tyr Gln Gln Gly Asp Leu Asp Lys Ala
210 215 220

Leu Leu Leu Thr Lys Lys Leu Leu Glu Leu Asp Pro Glu His Gln Arg
225 230 235 240

Ala Asn Gly Asn Leu Lys Tyr Phe Glu Tyr Ile Met Ala Lys Glu Lys
245 250 255

Asp Val Asn Lys Ser Ala Ser Asp Asp Gln Ser Asp Gln Lys Thr Thr
260 265 270

Pro Lys Lys Lys Gly Val Ala Val Asp Tyr Leu Pro Glu Arg Gln Lys
275 280 285

```
Tyr Glu Met Leu Cys Arg Gly Glu Gly Ile Lys Met Thr Pro Arg Arg
    290                 295                 300

Gln Lys Lys Leu Phe Cys Arg Tyr His Asp Gly Asn Arg Asn Pro Lys
305                 310                 315                 320

Phe Ile Leu Ala Pro Ala Lys Gln Glu Asp Glu Trp Asp Lys Pro Arg
                325                 330                 335

Ile Ile Arg Phe His Asp Ile Ile Ser Asp Ala Glu Ile Glu Ile Val
            340                 345                 350

Lys Asp Leu Ala Lys Pro Arg Leu Ser Arg Ala Thr Val His Asp Pro
        355                 360                 365

Glu Thr Gly Lys Leu Thr Thr Ala Gln Tyr Arg Val Ser Lys Ser Ala
    370                 375                 380

Trp Leu Ser Gly Tyr Glu Asn Pro Val Val Ser Arg Ile Asn Met Arg
385                 390                 395                 400

Ile Gln Asp Leu Thr Gly Leu Asp Val Ser Thr Ala Glu Glu Leu Gln
                405                 410                 415

Val Ala Asn Tyr Gly Val Gly Gly Gln Tyr Glu Pro His Phe Asp Phe
            420                 425                 430

Ala Arg Lys Asp Glu Pro Asp Ala Phe Lys Glu Leu Gly Thr Gly Asn
        435                 440                 445

Arg Ile Ala Thr Trp Leu Phe Tyr Met Ser Asp Val Ser Ala Gly Gly
    450                 455                 460

Ala Thr Val Phe Pro Glu Val Gly Ala Ser Val Trp Pro Lys Lys Gly
465                 470                 475                 480

Thr Ala Val Phe Trp Tyr Asn Leu Phe Ala Ser Gly Glu Gly Asp Tyr
                485                 490                 495

Ser Thr Arg His Ala Ala Cys Pro Val Leu Val Gly Asn Lys Trp Val
            500                 505                 510

Ser Asn Lys Trp Leu His Glu Arg Gly Gln Glu Phe Arg Arg Pro Cys
        515                 520                 525

Thr Leu Ser Glu Leu Glu
    530

<210>  88
<211>  162
<212>  PRT
<213>  Homo sapiens

<400>  88

Met Asp Ile Pro Gln Thr Lys Gln Asp Leu Glu Leu Pro Lys Leu Ala
1                   5                   10                  15

Gly Thr Trp His Ser Met Ala Met Ala Thr Asn Asn Ile Ser Leu Met
            20                  25                  30
```

```
Ala Thr Leu Lys Ala Pro Leu Arg Val His Ile Thr Ser Leu Leu Pro
        35                  40                  45

Thr Pro Glu Asp Asn Leu Glu Ile Val Leu His Arg Trp Glu Asn Asn
    50                  55                  60

Ser Cys Val Glu Lys Lys Val Leu Gly Glu Lys Thr Gly Asn Pro Lys
65                  70                  75                  80

Lys Phe Lys Ile Asn Tyr Thr Val Ala Asn Glu Ala Thr Leu Leu Asp
                85                  90                  95

Thr Asp Tyr Asp Asn Phe Leu Phe Leu Cys Leu Gln Asp Thr Thr Thr
            100                 105                 110

Pro Ile Gln Ser Met Met Cys Gln Tyr Leu Ala Arg Val Leu Val Glu
        115                 120                 125

Asp Asp Glu Ile Met Gln Gly Phe Ile Arg Ala Phe Arg Pro Leu Pro
    130                 135                 140

Arg His Leu Trp Tyr Leu Leu Asp Leu Lys Gln Met Glu Glu Pro Cys
145                 150                 155                 160

Arg Phe
```

<210> 89
<211> 449
<212> PRT
<213> Homo sapiens

<400> 89

```
Met Leu Pro Ala Ala Thr Ala Ser Leu Leu Gly Pro Leu Leu Thr Ala
1               5                   10                  15

Cys Ala Leu Leu Pro Phe Ala Gln Gly Gln Thr Pro Asn Tyr Thr Arg
            20                  25                  30

Pro Val Phe Leu Cys Gly Gly Asp Val Lys Gly Glu Ser Gly Tyr Val
        35                  40                  45

Ala Ser Glu Gly Phe Pro Asn Ser Tyr Pro Pro Asn Lys Glu Cys Ile
    50                  55                  60

Trp Thr Ile Thr Val Pro Glu Gly Gln Thr Val Ser Leu Ser Phe Arg
65                  70                  75                  80

Val Phe Asp Leu Glu Leu His Pro Ala Cys Arg Tyr Asp Ala Leu Glu
                85                  90                  95

Val Phe Ala Gly Ser Gly Thr Ser Gly Gln Arg Leu Gly Arg Phe Cys
            100                 105                 110

Gly Thr Phe Arg Pro Ala Pro Leu Val Ala Pro Gly Asn Gln Val Thr
        115                 120                 125

Leu Arg Met Thr Thr Asp Glu Gly Thr Gly Gly Arg Gly Phe Leu Leu
```

```
    130                 135                 140

Trp Tyr Ser Gly Arg Ala Thr Ser Gly Ser Glu His Gln Phe Cys Gly
145                 150                 155                 160

Gly Arg Leu Glu Lys Ala Gln Gly Thr Leu Thr Thr Pro Asn Trp Pro
                165                 170                 175

Glu Ser Asp Tyr Pro Pro Gly Ile Ser Cys Ser Trp His Ile Ile Ala
            180                 185                 190

Pro Pro Asp Gln Val Ile Ala Leu Thr Phe Glu Lys Phe Asp Leu Glu
        195                 200                 205

Pro Asp Thr Tyr Cys Arg Tyr Asp Ser Val Ser Val Phe Asn Gly Ala
    210                 215                 220

Val Ser Asp Asp Ser Arg Arg Leu Gly Lys Phe Cys Gly Asp Ala Val
225                 230                 235                 240

Pro Gly Ser Ile Ser Ser Glu Gly Asn Glu Leu Leu Val Gln Phe Val
                245                 250                 255

Ser Asp Leu Ser Val Thr Ala Asp Gly Phe Ser Ala Ser Tyr Lys Thr
            260                 265                 270

Leu Pro Arg Gly Thr Ala Lys Glu Gly Gln Gly Pro Gly Pro Lys Arg
        275                 280                 285

Gly Thr Glu Pro Lys Val Lys Leu Pro Pro Lys Ser Gln Pro Pro Glu
    290                 295                 300

Lys Thr Glu Glu Ser Pro Ser Ala Pro Asp Ala Pro Thr Cys Pro Lys
305                 310                 315                 320

Gln Cys Arg Arg Thr Gly Thr Leu Gln Ser Asn Phe Cys Ala Ser Ser
                325                 330                 335

Leu Val Val Thr Ala Thr Val Lys Ser Met Val Arg Glu Pro Gly Glu
            340                 345                 350

Gly Leu Ala Val Thr Val Ser Leu Ile Gly Ala Tyr Lys Thr Gly Gly
        355                 360                 365

Leu Asp Leu Pro Thr Pro Pro Thr Gly Ala Ser Leu Lys Phe Tyr Val
    370                 375                 380

Pro Cys Lys Gln Cys Pro Pro Met Lys Lys Gly Val Ser Tyr Leu Leu
385                 390                 395                 400

Met Gly Gln Val Glu Glu Asn Arg Gly Pro Val Leu Pro Pro Glu Ser
                405                 410                 415

Phe Val Val Leu His Arg Pro Asn Gln Asp Gln Ile Leu Thr Asn Leu
            420                 425                 430

Ser Lys Arg Lys Cys Pro Ser Gln Pro Val Arg Ala Ala Ala Ser Gln
        435                 440                 445

Asp
```

<210> 90
<211> 1089
<212> PRT
<213> Homo sapiens

<400> 90

Met Gly Thr Ser His Pro Ala Phe Leu Val Leu Gly Cys Leu Leu Thr
1 5 10 15

Gly Leu Ser Leu Ile Leu Cys Gln Leu Ser Leu Pro Ser Ile Leu Pro
20 25 30

Asn Glu Asn Glu Lys Val Val Gln Leu Asn Ser Ser Phe Ser Leu Arg
35 40 45

Cys Phe Gly Glu Ser Glu Val Ser Trp Gln Tyr Pro Met Ser Glu Glu
50 55 60

Glu Ser Ser Asp Val Glu Ile Arg Asn Glu Glu Asn Asn Ser Gly Leu
65 70 75 80

Phe Val Thr Val Leu Glu Val Ser Ser Ala Ser Ala Ala His Thr Gly
85 90 95

Leu Tyr Thr Cys Tyr Tyr Asn His Thr Gln Thr Glu Glu Asn Glu Leu
100 105 110

Glu Gly Arg His Ile Tyr Ile Tyr Val Pro Asp Pro Asp Val Ala Phe
115 120 125

Val Pro Leu Gly Met Thr Asp Tyr Leu Val Ile Val Glu Asp Asp Asp
130 135 140

Ser Ala Ile Ile Pro Cys Arg Thr Thr Asp Pro Glu Thr Pro Val Thr
145 150 155 160

Leu His Asn Ser Glu Gly Val Val Pro Ala Ser Tyr Asp Ser Arg Gln
165 170 175

Gly Phe Asn Gly Thr Phe Thr Val Gly Pro Tyr Ile Cys Glu Ala Thr
180 185 190

Val Lys Gly Lys Lys Phe Gln Thr Ile Pro Phe Asn Val Tyr Ala Leu
195 200 205

Lys Ala Thr Ser Glu Leu Asp Leu Glu Met Glu Ala Leu Lys Thr Val
210 215 220

Tyr Lys Ser Gly Glu Thr Ile Val Val Thr Cys Ala Val Phe Asn Asn
225 230 235 240

Glu Val Val Asp Leu Gln Trp Thr Tyr Pro Gly Glu Val Lys Gly Lys
245 250 255

Gly Ile Thr Met Leu Glu Glu Ile Lys Val Pro Ser Ile Lys Leu Val
260 265 270

```
Tyr Thr Leu Thr Val Pro Glu Ala Thr Val Lys Asp Ser Gly Asp Tyr
        275                 280                 285

Glu Cys Ala Ala Arg Gln Ala Thr Arg Glu Val Lys Glu Met Lys Lys
    290                 295                 300

Val Thr Ile Ser Val His Glu Lys Gly Phe Ile Glu Ile Lys Pro Thr
305                 310                 315                 320

Phe Ser Gln Leu Glu Ala Val Asn Leu His Glu Val Lys His Phe Val
                325                 330                 335

Val Glu Val Arg Ala Tyr Pro Pro Pro Arg Ile Ser Trp Leu Lys Asn
            340                 345                 350

Asn Leu Thr Leu Ile Glu Asn Leu Thr Glu Ile Thr Thr Asp Val Glu
        355                 360                 365

Lys Ile Gln Glu Ile Arg Tyr Arg Ser Lys Leu Lys Leu Ile Arg Ala
    370                 375                 380

Lys Glu Glu Asp Ser Gly His Tyr Thr Ile Val Ala Gln Asn Glu Asp
385                 390                 395                 400

Ala Val Lys Ser Tyr Thr Phe Glu Leu Leu Thr Gln Val Pro Ser Ser
                405                 410                 415

Ile Leu Asp Leu Val Asp Asp His His Gly Ser Thr Gly Gly Gln Thr
            420                 425                 430

Val Arg Cys Thr Ala Glu Gly Thr Pro Leu Pro Asp Ile Glu Trp Met
        435                 440                 445

Ile Cys Lys Asp Ile Lys Lys Cys Asn Asn Glu Thr Ser Trp Thr Ile
    450                 455                 460

Leu Ala Asn Asn Val Ser Asn Ile Ile Thr Glu Ile His Ser Arg Asp
465                 470                 475                 480

Arg Ser Thr Val Glu Gly Arg Val Thr Phe Ala Lys Val Glu Glu Thr
                485                 490                 495

Ile Ala Val Arg Cys Leu Ala Lys Asn Leu Leu Gly Ala Glu Asn Arg
            500                 505                 510

Glu Leu Lys Leu Val Ala Pro Thr Leu Arg Ser Glu Leu Thr Val Ala
        515                 520                 525

Ala Ala Val Leu Val Leu Leu Val Ile Val Ile Ile Ser Leu Ile Val
    530                 535                 540

Leu Val Val Ile Trp Lys Gln Lys Pro Arg Tyr Glu Ile Arg Trp Arg
545                 550                 555                 560

Val Ile Glu Ser Ile Ser Pro Asp Gly His Glu Tyr Ile Tyr Val Asp
                565                 570                 575

Pro Met Gln Leu Pro Tyr Asp Ser Arg Trp Glu Phe Pro Arg Asp Gly
            580                 585                 590
```

Leu Val Leu Gly Arg Val Leu Gly Ser Gly Ala Phe Gly Lys Val Val
595 600 605

Glu Gly Thr Ala Tyr Gly Leu Ser Arg Ser Gln Pro Val Met Lys Val
610 615 620

Ala Val Lys Met Leu Lys Pro Thr Ala Arg Ser Ser Glu Lys Gln Ala
625 630 635 640

Leu Met Ser Glu Leu Lys Ile Met Thr His Leu Gly Pro His Leu Asn
645 650 655

Ile Val Asn Leu Leu Gly Ala Cys Thr Lys Ser Gly Pro Ile Tyr Ile
660 665 670

Ile Thr Glu Tyr Cys Phe Tyr Gly Asp Leu Val Asn Tyr Leu His Lys
675 680 685

Asn Arg Asp Ser Phe Leu Ser His His Pro Glu Lys Pro Lys Lys Glu
690 695 700

Leu Asp Ile Phe Gly Leu Asn Pro Ala Asp Glu Ser Thr Arg Ser Tyr
705 710 715 720

Val Ile Leu Ser Phe Glu Asn Asn Gly Asp Tyr Met Asp Met Lys Gln
725 730 735

Ala Asp Thr Thr Gln Tyr Val Pro Met Leu Glu Arg Lys Glu Val Ser
740 745 750

Lys Tyr Ser Asp Ile Gln Arg Ser Leu Tyr Asp Arg Pro Ala Ser Tyr
755 760 765

Lys Lys Lys Ser Met Leu Asp Ser Glu Val Lys Asn Leu Leu Ser Asp
770 775 780

Asp Asn Ser Glu Gly Leu Thr Leu Leu Asp Leu Leu Ser Phe Thr Tyr
785 790 795 800

Gln Val Ala Arg Gly Met Glu Phe Leu Ala Ser Lys Asn Cys Val His
805 810 815

Arg Asp Leu Ala Ala Arg Asn Val Leu Leu Ala Gln Gly Lys Ile Val
820 825 830

Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp Ile Met His Asp Ser Asn
835 840 845

Tyr Val Ser Lys Gly Ser Thr Phe Leu Pro Val Lys Trp Met Ala Pro
850 855 860

Glu Ser Ile Phe Asp Asn Leu Tyr Thr Thr Leu Ser Asp Val Trp Ser
865 870 875 880

Tyr Gly Ile Leu Leu Trp Glu Ile Phe Ser Leu Gly Gly Thr Pro Tyr
885 890 895

Pro Gly Met Met Val Asp Ser Thr Phe Tyr Asn Lys Ile Lys Ser Gly
900 905 910

Tyr Arg Met Ala Lys Pro Asp His Ala Thr Ser Glu Val Tyr Glu Ile
915 920 925

Met Val Lys Cys Trp Asn Ser Glu Pro Glu Lys Arg Pro Ser Phe Tyr
930 935 940

His Leu Ser Glu Ile Val Glu Asn Leu Leu Pro Gly Gln Tyr Lys Lys
945 950 955 960

Ser Tyr Glu Lys Ile His Leu Asp Phe Leu Lys Ser Asp His Pro Ala
965 970 975

Val Ala Arg Met Arg Val Asp Ser Asp Asn Ala Tyr Ile Gly Val Thr
980 985 990

Tyr Lys Asn Glu Glu Asp Lys Leu Lys Asp Trp Glu Gly Gly Leu Asp
995 1000 1005

Glu Gln Arg Leu Ser Ala Asp Ser Gly Tyr Ile Ile Pro Leu Pro
1010 1015 1020

Asp Ile Asp Pro Val Pro Glu Glu Glu Asp Leu Gly Lys Arg Asn
1025 1030 1035

Arg His Ser Ser Gln Thr Ser Glu Glu Ser Ala Ile Glu Thr Gly
1040 1045 1050

Ser Ser Ser Ser Thr Phe Ile Lys Arg Glu Asp Glu Thr Ile Glu
1055 1060 1065

Asp Ile Asp Met Met Asp Asp Ile Gly Ile Asp Ser Ser Asp Leu
1070 1075 1080

Val Glu Asp Ser Phe Leu
1085

<210> 91
<211> 318
<212> PRT
<213> Homo sapiens

<400> 91

Met Pro Asn Ile Lys Ile Phe Ser Gly Ser Ser His Gln Asp Leu Ser
1 5 10 15

Gln Lys Ile Ala Asp Arg Leu Gly Leu Glu Leu Gly Lys Val Val Thr
20 25 30

Lys Lys Phe Ser Asn Gln Glu Thr Cys Val Glu Ile Gly Glu Ser Val
35 40 45

Arg Gly Glu Asp Val Tyr Ile Val Gln Ser Gly Cys Gly Glu Ile Asn
50 55 60

Asp Asn Leu Met Glu Leu Leu Ile Met Ile Asn Ala Cys Lys Ile Ala
65 70 75 80

Ser Ala Ser Arg Val Thr Ala Val Ile Pro Cys Phe Pro Tyr Ala Arg
85 90 95

Gln Asp Lys Lys Asp Lys Ser Arg Ala Pro Ile Ser Ala Lys Leu Val
100 105 110

Ala Asn Met Leu Ser Val Ala Gly Ala Asp His Ile Ile Thr Met Asp
115 120 125

Leu His Ala Ser Gln Ile Gln Gly Phe Phe Asp Ile Pro Val Asp Asn
130 135 140

Leu Tyr Ala Glu Pro Ala Val Leu Lys Trp Ile Arg Glu Asn Ile Ser
145 150 155 160

Glu Trp Arg Asn Cys Thr Ile Val Ser Pro Asp Ala Gly Gly Ala Lys
165 170 175

Arg Val Thr Ser Ile Ala Asp Arg Leu Asn Val Asp Phe Ala Leu Ile
180 185 190

His Lys Glu Arg Lys Lys Ala Asn Glu Val Asp Arg Met Val Leu Val
195 200 205

Gly Asp Val Lys Asp Arg Val Ala Ile Leu Val Asp Asp Met Ala Asp
210 215 220

Thr Cys Gly Thr Ile Cys His Ala Ala Asp Lys Leu Leu Ser Ala Gly
225 230 235 240

Ala Thr Arg Val Tyr Ala Ile Leu Thr His Gly Ile Phe Ser Gly Pro
245 250 255

Ala Ile Ser Arg Ile Asn Asn Ala Cys Phe Glu Ala Val Val Val Thr
260 265 270

Asn Thr Ile Pro Gln Glu Asp Lys Met Lys His Cys Ser Lys Ile Gln
275 280 285

Val Ile Asp Ile Ser Met Ile Leu Ala Glu Ala Ile Arg Arg Thr His
290 295 300

Asn Gly Glu Ser Val Ser Tyr Leu Phe Ser His Val Pro Leu
305 310 315

<210> 92
<211> 318
<212> PRT
<213> Homo sapiens

<400> 92

Met Pro Asn Ile Val Leu Phe Ser Gly Ser Ser His Gln Asp Leu Ser
1 5 10 15

Gln Arg Val Ala Asp Arg Leu Gly Leu Glu Leu Gly Lys Val Val Thr
20 25 30

Lys Lys Phe Ser Asn Gln Glu Thr Ser Val Glu Ile Gly Glu Ser Val
35 40 45

Arg Gly Glu Asp Val Tyr Ile Ile Gln Ser Gly Cys Gly Glu Ile Asn

```
    50                  55                  60

Asp Asn Leu Met Glu Leu Leu Ile Met Ile Asn Ala Cys Lys Ile Ala
65                  70                  75                  80

Ser Ser Ser Arg Val Thr Ala Val Ile Pro Cys Phe Pro Tyr Ala Arg
                85                  90                  95

Gln Asp Lys Lys Asp Lys Ser Arg Ala Pro Ile Ser Ala Lys Leu Val
            100                 105                 110

Ala Asn Met Leu Ser Val Ala Gly Ala Asp His Ile Ile Thr Met Asp
        115                 120                 125

Leu His Ala Ser Gln Ile Gln Gly Phe Phe Asp Ile Pro Val Asp Asn
    130                 135                 140

Leu Tyr Ala Glu Pro Ala Val Leu Gln Trp Ile Arg Glu Asn Ile Ala
145                 150                 155                 160

Glu Trp Lys Asn Cys Ile Ile Val Ser Pro Asp Ala Gly Gly Ala Lys
                165                 170                 175

Arg Val Thr Ser Ile Ala Asp Arg Leu Asn Val Glu Phe Ala Leu Ile
            180                 185                 190

His Lys Glu Arg Lys Lys Ala Asn Glu Val Asp Arg Met Val Leu Val
        195                 200                 205

Gly Asp Val Lys Asp Arg Val Ala Ile Leu Val Asp Asp Met Ala Asp
    210                 215                 220

Thr Cys Gly Thr Ile Cys His Ala Ala Asp Lys Leu Leu Ser Ala Gly
225                 230                 235                 240

Ala Thr Lys Val Tyr Ala Ile Leu Thr His Gly Ile Phe Ser Gly Pro
                245                 250                 255

Ala Ile Ser Arg Ile Asn Asn Ala Ala Phe Glu Ala Val Val Val Thr
            260                 265                 270

Asn Thr Ile Pro Gln Glu Asp Lys Met Lys His Cys Thr Lys Ile Gln
        275                 280                 285

Val Ile Asp Ile Ser Met Ile Leu Ala Glu Ala Ile Arg Arg Thr His
    290                 295                 300

Asn Gly Glu Ser Val Ser Tyr Leu Phe Ser His Val Pro Leu
305                 310                 315

<210>  93
<211>  244
<212>  PRT
<213>  Homo sapiens

<400>  93

Met Ala Ala Ala Ala Ala Ala Gly Glu Ala Arg Arg Val Leu Val Tyr
1               5                   10                  15
```

```
Gly Gly Arg Gly Ala Leu Gly Ser Arg Cys Val Gln Ala Phe Arg Ala
            20                  25                  30

Arg Asn Trp Trp Val Ala Ser Val Asp Val Val Glu Asn Glu Glu Ala
        35                  40                  45

Ser Ala Thr Ile Ile Val Lys Met Thr Asp Ser Phe Thr Glu Gln Ala
    50                  55                  60

Asp Gln Val Thr Ala Glu Val Gly Lys Leu Leu Gly Glu Glu Lys Val
65                  70                  75                  80

Asp Ala Ile Leu Cys Val Ala Gly Gly Trp Ala Gly Gly Asn Ala Lys
                85                  90                  95

Ser Lys Ser Leu Phe Lys Asn Cys Asp Leu Met Trp Lys Gln Ser Ile
            100                 105                 110

Trp Thr Ser Thr Ile Ser Ser His Leu Ala Thr Lys His Leu Lys Glu
        115                 120                 125

Gly Gly Leu Leu Thr Leu Ala Gly Ala Lys Ala Ala Leu Asp Gly Thr
    130                 135                 140

Pro Gly Met Ile Gly Tyr Gly Met Ala Lys Gly Ala Val His Gln Leu
145                 150                 155                 160

Cys Gln Ser Leu Ala Gly Lys Asn Ser Gly Met Pro Pro Gly Ala Ala
                165                 170                 175

Ala Ile Ala Val Leu Pro Val Thr Leu Asp Thr Pro Met Asn Arg Lys
            180                 185                 190

Ser Met Pro Glu Ala Asp Phe Ser Ser Trp Thr Pro Leu Glu Phe Leu
        195                 200                 205

Val Glu Thr Phe His Asp Trp Ile Thr Gly Lys Asn Arg Pro Ser Ser
    210                 215                 220

Gly Ser Leu Ile Gln Val Val Thr Thr Glu Gly Arg Thr Glu Leu Thr
225                 230                 235                 240

Pro Ala Tyr Phe


<210>  94
<211>  331
<212>  PRT
<213>  Homo sapiens

<400>  94

Met Gly Thr Pro Gln Lys Asp Val Ile Ile Lys Ser Asp Ala Pro Asp
1               5                   10                  15

Thr Leu Leu Leu Glu Lys His Ala Asp Tyr Ile Ala Ser Tyr Gly Ser
            20                  25                  30

Lys Lys Asp Asp Tyr Glu Tyr Cys Met Ser Glu Tyr Leu Arg Met Ser
        35                  40                  45
```

```
Gly Ile Tyr Trp Gly Leu Thr Val Met Asp Leu Met Gly Gln Leu His
    50                  55                  60

Arg Met Asn Arg Glu Glu Ile Leu Ala Phe Ile Lys Ser Cys Gln His
65                  70                  75                  80

Glu Cys Gly Gly Ile Ser Ala Ser Ile Gly His Asp Pro His Leu Leu
                85                  90                  95

Tyr Thr Leu Ser Ala Val Gln Ile Leu Thr Leu Tyr Asp Ser Ile Asn
            100                 105                 110

Val Ile Asp Val Asn Lys Val Val Glu Tyr Val Lys Gly Leu Gln Lys
        115                 120                 125

Glu Asp Gly Ser Phe Ala Gly Asp Ile Trp Gly Glu Ile Asp Thr Arg
    130                 135                 140

Phe Ser Phe Cys Ala Val Ala Thr Leu Ala Leu Leu Gly Lys Leu Asp
145                 150                 155                 160

Ala Ile Asn Val Glu Lys Ala Ile Glu Phe Val Leu Ser Cys Met Asn
                165                 170                 175

Phe Asp Gly Gly Phe Gly Cys Arg Pro Gly Ser Glu Ser His Ala Gly
            180                 185                 190

Gln Ile Tyr Cys Cys Thr Gly Phe Leu Ala Ile Thr Ser Gln Leu His
        195                 200                 205

Gln Val Asn Ser Asp Leu Leu Gly Trp Trp Leu Cys Glu Arg Gln Leu
    210                 215                 220

Pro Ser Gly Gly Leu Asn Gly Arg Pro Glu Lys Leu Pro Asp Val Cys
225                 230                 235                 240

Tyr Ser Trp Trp Val Leu Ala Ser Leu Lys Ile Ile Gly Arg Leu His
                245                 250                 255

Trp Ile Asp Arg Glu Lys Leu Arg Asn Phe Ile Leu Ala Cys Gln Asp
            260                 265                 270

Glu Glu Thr Gly Gly Phe Ala Asp Arg Pro Gly Asp Met Val Asp Pro
        275                 280                 285

Phe His Thr Leu Phe Gly Ile Ala Gly Leu Ser Leu Leu Gly Glu Glu
    290                 295                 300

Gln Ile Lys Pro Val Asn Pro Val Phe Cys Met Pro Glu Glu Val Leu
305                 310                 315                 320

Gln Arg Val Asn Val Gln Pro Glu Leu Val Ser
                325                 330
```

<210> 95
<211> 93
<212> PRT
<213> Homo sapiens

<400> 95

Met Asn Ala Lys Val Val Val Val Leu Val Leu Val Leu Thr Ala Leu
1 5 10 15

Cys Leu Ser Asp Gly Lys Pro Val Ser Leu Ser Tyr Arg Cys Pro Cys
20 25 30

Arg Phe Phe Glu Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys
35 40 45

Ile Leu Asn Thr Pro Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys
50 55 60

Asn Asn Asn Arg Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln
65 70 75 80

Glu Tyr Leu Glu Lys Ala Leu Asn Lys Arg Phe Lys Met
85 90

<210> 96
<211> 381
<212> PRT
<213> Homo sapiens

<220>
<221> UNSURE
<222> (59)..(59)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (300)..(300)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (318)..(318)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (330)..(330)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (345)..(345)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (352)..(352)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (367)..(367)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (369)..(369)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (376)..(376)
<223> Xaa = any amino acid

<220>
<221> UNSURE
<222> (378)..(378)
<223> Xaa = any amino acid

<400> 96

Met Trp Arg Ser Leu Gly Leu Ala Leu Ala Leu Cys Leu Leu Pro Ser
1 5 10 15

Gly Gly Thr Glu Ser Gln Asp Gln Ser Ser Leu Cys Lys Gln Pro Pro
20 25 30

Ala Trp Ser Ile Arg Asp Gln Asp Pro Met Leu Asn Ser Asn Gly Ser
35 40 45

Val Thr Val Val Ala Leu Leu Gln Ala Ser Xaa Tyr Leu Cys Ile Ile
50 55 60

Glu Ala Ser Lys Leu Glu Asp Leu Arg Val Lys Leu Lys Lys Glu Gly
65 70 75 80

Tyr Ser Asn Ile Ser Tyr Ile Val Val Asn His Gln Gly Ile Ser Ser
85 90 95

Arg Leu Lys Tyr Thr His Leu Lys Asn Lys Val Ser Glu His Ile Pro
100 105 110

Val Tyr Gln Gln Glu Glu Asn Gln Thr Asp Val Trp Thr Leu Leu Asn
115 120 125

Gly Ser Lys Asp Asp Phe Leu Ile Tyr Asp Arg Cys Gly Arg Leu Val
130 135 140

Tyr His Leu Gly Leu Pro Phe Ser Phe Leu Thr Phe Pro Tyr Val Glu
145 150 155 160

Glu Ala Ile Lys Ile Ala Tyr Cys Glu Lys Lys Cys Gly Asn Cys Ser
165 170 175

```
Leu Thr Thr Leu Lys Asp Glu Asp Phe Cys Lys Arg Val Ser Leu Ala
            180                 185                 190

Thr Val Asp Lys Thr Val Glu Thr Pro Ser Pro His Tyr His His Glu
        195                 200                 205

His His His Asn His Gly His Gln His Leu Gly Ser Ser Glu Leu Ser
    210                 215                 220

Glu Asn Gln Gln Pro Gly Ala Pro Asn Ala Pro Thr His Pro Ala Pro
225                 230                 235                 240

Pro Gly Leu His His His His Lys His Lys Gly Gln His Arg Gln Gly
                245                 250                 255

His Pro Glu Asn Arg Asp Met Pro Ala Ser Glu Asp Leu Gln Asp Leu
            260                 265                 270

Gln Lys Lys Leu Cys Arg Lys Arg Cys Ile Asn Gln Leu Leu Cys Lys
        275                 280                 285

Leu Pro Thr Asp Ser Glu Leu Ala Pro Arg Ser Xaa Cys Cys His Cys
    290                 295                 300

Arg His Leu Ile Phe Glu Lys Thr Gly Ser Ala Ile Thr Xaa Gln Cys
305                 310                 315                 320

Lys Glu Asn Leu Pro Ser Leu Cys Ser Xaa Gln Gly Leu Arg Ala Glu
                325                 330                 335

Glu Asn Ile Thr Glu Ser Cys Gln Xaa Arg Leu Pro Pro Ala Ala Xaa
            340                 345                 350

Gln Ile Ser Gln Gln Leu Ile Pro Thr Glu Ala Ser Ala Ser Xaa Arg
        355                 360                 365

Xaa Lys Asn Gln Ala Lys Lys Xaa Glu Xaa Pro Ser Asn
    370                 375                 380

<210>  97
<211>  220
<212>  PRT
<213>  Homo sapiens

<400>  97

Met Ala Ile Leu Phe Ala Val Val Ala Arg Gly Thr Thr Ile Leu Ala
1               5                   10                  15

Lys His Ala Trp Cys Gly Gly Asn Phe Leu Glu Val Thr Glu Gln Ile
            20                  25                  30

Leu Ala Lys Ile Pro Ser Glu Asn Asn Lys Leu Thr Tyr Ser His Gly
        35                  40                  45

Asn Tyr Leu Phe His Tyr Ile Cys Gln Asp Arg Ile Val Tyr Leu Cys
    50                  55                  60

Ile Thr Asp Asp Asp Phe Glu Arg Ser Arg Ala Phe Asn Phe Leu Asn
65                  70                  75                  80
```

Glu Ile Lys Lys Arg Phe Gln Thr Thr Tyr Gly Ser Arg Ala Gln Thr
85 90 95

Ala Leu Pro Tyr Ala Met Asn Ser Glu Phe Ser Ser Val Leu Ala Ala
100 105 110

Gln Leu Lys His His Ser Glu Asn Lys Gly Leu Asp Lys Val Met Glu
115 120 125

Thr Gln Ala Gln Val Asp Glu Leu Lys Gly Ile Met Val Arg Asn Ile
130 135 140

Asp Leu Val Ala Gln Arg Gly Glu Arg Leu Glu Leu Leu Ile Asp Lys
145 150 155 160

Thr Glu Asn Leu Val Asp Ser Ser Val Thr Phe Lys Thr Thr Ser Arg
165 170 175

Asn Leu Ala Arg Ala Met Cys Met Lys Asn Leu Lys Leu Thr Ile Ile
180 185 190

Ile Ile Ile Val Ser Ile Val Phe Ile Tyr Ile Ile Val Ser Pro Leu
195 200 205

Cys Gly Gly Phe Thr Trp Pro Ser Cys Val Lys Lys
210 215 220

<210> 98
<211> 1736
<212> PRT
<213> Homo sapiens

<400> 98

Met Glu Glu Thr Ala Ile Trp Glu Gln His Thr Val Thr Leu His Arg
1 5 10 15

Ala Pro Gly Phe Gly Phe Gly Ile Ala Ile Ser Gly Gly Arg Asp Asn
20 25 30

Pro His Phe Gln Ser Gly Glu Thr Ser Ile Val Ile Ser Asp Val Leu
35 40 45

Lys Gly Gly Pro Ala Glu Gly Gln Leu Gln Glu Asn Asp Arg Val Ala
50 55 60

Met Val Asn Gly Val Ser Met Asp Asn Val Glu His Ala Phe Ala Val
65 70 75 80

Gln Gln Leu Arg Lys Ser Gly Lys Asn Ala Lys Ile Thr Ile Arg Arg
85 90 95

Lys Lys Lys Val Gln Ile Pro Val Ser Arg Pro Asp Pro Glu Pro Val
100 105 110

Ser Asp Asn Glu Glu Asp Ser Tyr Asp Glu Glu Ile His Asp Pro Arg
115 120 125

Ser Gly Arg Ser Gly Val Val Asn Arg Arg Ser Glu Lys Ile Trp Pro

```
    130                 135                 140

Arg Asp Arg Ser Ala Ser Arg Glu Arg Ser Leu Ser Pro Arg Ser Asp
145                 150                 155                 160

Arg Arg Ser Val Ala Ser Ser Gln Pro Ala Lys Pro Thr Lys Val Thr
                165                 170                 175

Leu Val Lys Ser Arg Lys Asn Glu Glu Tyr Gly Leu Arg Leu Ala Ser
            180                 185                 190

His Ile Phe Val Lys Glu Ile Ser Gln Asp Ser Leu Ala Ala Arg Asp
        195                 200                 205

Gly Asn Ile Gln Glu Gly Asp Val Val Leu Lys Ile Asn Gly Thr Val
    210                 215                 220

Thr Glu Asn Met Ser Leu Thr Asp Ala Lys Thr Leu Ile Glu Arg Ser
225                 230                 235                 240

Lys Gly Lys Leu Lys Met Val Val Gln Arg Asp Glu Arg Ala Thr Leu
                245                 250                 255

Leu Asn Val Pro Asp Leu Ser Asp Ser Ile His Ser Ala Asn Ala Ser
            260                 265                 270

Glu Arg Asp Asp Ile Ser Glu Ile Gln Ser Leu Ala Ser Asp His Ser
        275                 280                 285

Gly Arg Ser His Asp Arg Pro Pro Arg Arg Ser Arg Ser Arg Ser Pro
    290                 295                 300

Asp Gln Arg Ser Glu Pro Ser Asp His Ser Arg His Ser Pro Gln Gln
305                 310                 315                 320

Pro Ser Asn Gly Ser Leu Arg Ser Arg Asp Glu Glu Arg Ile Ser Lys
                325                 330                 335

Pro Gly Ala Val Ser Thr Pro Val Lys His Ala Asp Asp His Thr Pro
            340                 345                 350

Lys Thr Val Glu Glu Val Thr Val Glu Arg Asn Glu Lys Gln Thr Pro
        355                 360                 365

Ser Leu Pro Glu Pro Lys Pro Val Tyr Ala Gln Val Gly Asn Gln Met
    370                 375                 380

Trp Ile Tyr Leu Ser Val His Leu Met Val Ser Tyr Leu Ile Gln Leu
385                 390                 395                 400

Met Lys Met Gly Phe Leu Arg Pro Ser Met Lys Leu Val Lys Phe Arg
                405                 410                 415

Lys Gly Asp Ser Val Gly Leu Arg Leu Ala Gly Gly Asn Asp Val Gly
            420                 425                 430

Ile Phe Val Ala Gly Val Leu Glu Asp Ser Pro Ala Ala Lys Glu Gly
        435                 440                 445

Leu Glu Glu Gly Asp Gln Ile Leu Arg Val Asn Asn Val Asp Phe Thr
```

```
    450                 455                 460

Asn Ile Ile Arg Glu Glu Ala Val Leu Phe Leu Leu Asp Leu Pro Lys
465                 470                 475                 480

Gly Glu Glu Val Thr Ile Leu Ala Gln Lys Lys Lys Asp Val Tyr Arg
                485                 490                 495

Arg Ile Val Glu Ser Asp Val Gly Asp Ser Phe Tyr Ile Arg Thr His
            500                 505                 510

Phe Glu Tyr Glu Lys Glu Ser Pro Tyr Gly Leu Ser Phe Asn Lys Gly
        515                 520                 525

Glu Val Phe Arg Ala Val Asp Thr Leu Tyr Asn Gly Lys Leu Gly Ser
    530                 535                 540

Trp Leu Ala Ile Arg Ile Gly Lys Asn His Lys Glu Val Glu Arg Gly
545                 550                 555                 560

Ile Ile Pro Asn Lys Asn Arg Ala Glu Gln Leu Ala Ser Val Gln Tyr
                565                 570                 575

Thr Leu Pro Lys Thr Ala Gly Gly Asp Arg Ala Asp Phe Trp Arg Phe
            580                 585                 590

Arg Gly Leu Arg Ser Ser Lys Arg Asn Leu Arg Lys Ser Arg Glu Asp
        595                 600                 605

Leu Ser Ala Gln Pro Val Gln Thr Lys Phe Pro Ala Tyr Glu Arg Val
    610                 615                 620

Val Leu Arg Glu Ala Gly Phe Leu Arg Pro Val Thr Ile Phe Gly Pro
625                 630                 635                 640

Ile Ala Asp Val Ala Arg Glu Lys Leu Ala Arg Glu Glu Pro Asp Ile
                645                 650                 655

Tyr Gln Ile Ala Lys Ser Glu Pro Arg Asp Ala Gly Thr Asp Gln Arg
            660                 665                 670

Ser Ser Gly Tyr Ile Arg Leu His Thr Ile Lys Gln Ile Ile Asp Gln
        675                 680                 685

Asp Lys His Ala Leu Leu Asp Val Thr Pro Asn Ala Val Asp Arg Leu
    690                 695                 700

Asn Tyr Ala Gln Trp Tyr Pro Ile Val Val Phe Leu Asn Pro Asp Ser
705                 710                 715                 720

Lys Gln Gly Val Lys Thr Met Arg Met Arg Leu Cys Pro Glu Ser Arg
                725                 730                 735

Lys Ser Ala Arg Lys Leu Tyr Glu Arg Ser His Lys Leu Ala Lys Asn
            740                 745                 750

Asn His His Leu Phe Thr Thr Thr Ile Asn Leu Asn Ser Met Asn Asp
        755                 760                 765

Gly Trp Tyr Gly Ala Leu Lys Glu Ala Val Gln Gln Gln Gln Asn Gln
```

```
    770                 775                 780

Leu Val Trp Val Ser Glu Gly Lys Ala Asp Gly Ala Thr Ser Asp Asp
785                 790                 795                 800

Leu Asp Leu His Asp Asp Arg Leu Ser Tyr Leu Ser Ala Pro Gly Ser
                805                 810                 815

Glu Tyr Ser Met Tyr Ser Thr Asp Ser Arg His Thr Ser Asp Tyr Glu
            820                 825                 830

Asp Thr Asp Thr Glu Gly Gly Ala Tyr Thr Asp Gln Glu Leu Asp Glu
        835                 840                 845

Thr Leu Asn Asp Glu Val Gly Thr Pro Pro Glu Ser Ala Ile Thr Arg
    850                 855                 860

Ser Ser Glu Pro Val Arg Glu Asp Ser Ser Gly Met His His Glu Asn
865                 870                 875                 880

Gln Thr Tyr Pro Pro Tyr Ser Pro Gln Ala Gln Pro Gln Pro Ile His
                885                 890                 895

Arg Ile Asp Ser Pro Gly Phe Lys Pro Ala Ser Gln Gln Lys Ala Glu
            900                 905                 910

Ala Ser Ser Pro Val Pro Tyr Leu Ser Pro Glu Thr Asn Pro Ala Ser
        915                 920                 925

Ser Thr Ser Ala Val Asn His Asn Val Asn Leu Thr Asn Val Arg Leu
    930                 935                 940

Glu Glu Pro Thr Pro Ala Pro Ser Thr Ser Tyr Ser Pro Gln Ala Asp
945                 950                 955                 960

Ser Leu Arg Thr Pro Ser Thr Glu Ala Ala His Ile Met Leu Arg Asp
                965                 970                 975

Gln Glu Pro Ser Leu Ser Ser His Val Asp Pro Thr Lys Val Tyr Arg
            980                 985                 990

Lys Asp Pro Tyr Pro Glu Glu Met  Met Arg Gln Asn His  Val Leu Lys
        995                 1000                1005

Gln Pro  Ala Val Ser His Pro  Gly His Arg Pro Asp  Lys Glu Pro
    1010                1015                1020

Asn Leu  Thr Tyr Glu Pro Gln  Leu Pro Tyr Val Glu  Lys Gln Ala
    1025                1030                1035

Ser Arg  Asp Leu Glu Gln Pro  Thr Tyr Arg Tyr Glu  Ser Ser Ser
    1040                1045                1050

Tyr Thr  Asp Gln Phe Ser Arg  Asn Tyr Glu His Arg  Leu Arg Tyr
    1055                1060                1065

Glu Asp  Arg Val Pro Met Tyr  Glu Glu Gln Trp Ser  Tyr Tyr Asp
    1070                1075                1080

Asp Lys  Gln Pro Tyr Pro Ser  Arg Pro Pro Phe Asp  Asn Gln His
```

1085 1090 1095

Ser Gln Asp Leu Asp Ser Arg Gln His Pro Glu Glu Ser Ser Glu
1100 1105 1110

Arg Gly Tyr Phe Pro Arg Phe Glu Glu Pro Ala Pro Leu Ser Tyr
1115 1120 1125

Asp Ser Arg Pro Arg Tyr Glu Gln Ala Pro Arg Ala Ser Ala Leu
1130 1135 1140

Arg His Glu Glu Gln Pro Ala Pro Gly Tyr Asp Thr His Gly Arg
1145 1150 1155

Leu Arg Pro Glu Ala Gln Pro His Pro Ser Ala Gly Pro Lys Pro
1160 1165 1170

Ala Glu Ser Lys Gln Tyr Phe Glu Gln Tyr Ser Arg Ser Tyr Glu
1175 1180 1185

Gln Val Pro Pro Gln Gly Phe Thr Ser Arg Ala Gly His Phe Glu
1190 1195 1200

Pro Leu His Gly Ala Ala Ala Val Pro Pro Leu Ile Pro Ser Ser
1205 1210 1215

Gln His Lys Pro Glu Ala Leu Pro Ser Asn Thr Lys Pro Leu Pro
1220 1225 1230

Pro Pro Pro Thr Gln Thr Glu Glu Glu Glu Asp Pro Ala Met Lys
1235 1240 1245

Pro Gln Ser Val Leu Thr Arg Val Lys Met Phe Glu Asn Lys Arg
1250 1255 1260

Ser Ala Ser Leu Glu Thr Lys Lys Asp Val Asn Asp Thr Gly Ser
1265 1270 1275

Phe Lys Pro Pro Glu Val Ala Ser Lys Pro Ser Gly Ala Pro Ile
1280 1285 1290

Ile Gly Pro Lys Pro Thr Ser Gln Asn Gln Phe Ser Glu His Asp
1295 1300 1305

Lys Thr Leu Tyr Arg Ile Pro Glu Pro Gln Lys Pro Gln Leu Lys
1310 1315 1320

Pro Pro Glu Asp Ile Val Arg Ser Asn His Tyr Asp Pro Glu Glu
1325 1330 1335

Asp Glu Glu Tyr Tyr Arg Lys Gln Leu Ser Tyr Phe Asp Arg Arg
1340 1345 1350

Ser Phe Glu Asn Lys Pro Pro Ala His Ile Ala Ala Ser His Leu
1355 1360 1365

Ser Glu Pro Ala Lys Pro Ala His Ser Gln Asn Gln Ser Asn Phe
1370 1375 1380

Ser Ser Tyr Ser Ser Lys Gly Lys Pro Pro Glu Ala Asp Gly Val

1385 1390 1395

Asp Arg Ser Phe Gly Glu Lys Arg Tyr Glu Pro Ile Gln Ala Thr
1400 1405 1410

Pro Pro Pro Pro Pro Leu Pro Ser Gln Tyr Ala Gln Pro Ser Gln
1415 1420 1425

Pro Val Thr Ser Ala Ser Leu His Ile His Ser Lys Gly Ala His
1430 1435 1440

Gly Glu Gly Asn Ser Val Ser Leu Asp Phe Gln Asn Ser Leu Val
1445 1450 1455

Ser Lys Pro Asp Pro Pro Pro Ser Gln Asn Lys Pro Ala Thr Phe
1460 1465 1470

Arg Pro Pro Asn Arg Glu Asp Thr Ala Gln Ala Ala Phe Tyr Pro
1475 1480 1485

Gln Lys Ser Phe Pro Asp Lys Ala Pro Val Asn Gly Thr Glu Gln
1490 1495 1500

Thr Gln Lys Thr Val Thr Pro Ala Tyr Asn Arg Phe Thr Pro Lys
1505 1510 1515

Pro Tyr Thr Ser Ser Ala Arg Pro Phe Glu Arg Lys Phe Glu Ser
1520 1525 1530

Pro Lys Phe Asn His Asn Leu Leu Pro Ser Glu Thr Ala His Lys
1535 1540 1545

Pro Asp Leu Ser Ser Lys Thr Pro Thr Ser Pro Lys Thr Leu Val
1550 1555 1560

Lys Ser His Ser Leu Ala Gln Pro Pro Glu Phe Asp Ser Gly Val
1565 1570 1575

Glu Thr Phe Ser Ile His Ala Glu Lys Pro Lys Tyr Gln Ile Asn
1580 1585 1590

Asn Ile Ser Thr Val Pro Lys Ala Ile Pro Val Ser Pro Ser Ala
1595 1600 1605

Val Glu Glu Asp Glu Asp Glu Asp Gly His Thr Val Val Ala Thr
1610 1615 1620

Ala Arg Gly Ile Phe Asn Ser Asn Gly Gly Val Leu Ser Ser Ile
1625 1630 1635

Glu Thr Gly Val Ser Ile Ile Ile Pro Gln Gly Ala Ile Pro Glu
1640 1645 1650

Gly Val Glu Gln Glu Ile Tyr Phe Lys Val Cys Arg Asp Asn Ser
1655 1660 1665

Ile Leu Pro Pro Leu Asp Lys Glu Lys Gly Glu Thr Leu Leu Ser
1670 1675 1680

Pro Leu Val Met Cys Gly Pro His Gly Leu Lys Phe Leu Lys Pro

1685 1690 1695

Val Glu Leu Arg Leu Pro His Cys Asp Pro Lys Thr Trp Gln Asn
1700 1705 1710

Lys Cys Leu Pro Gly Asp Pro Asn Tyr Leu Val Gly Ala Asn Cys
1715 1720 1725

Val Ser Val Leu Ile Asp His Phe
1730 1735

<210> 99
<211> 93
<212> PRT
<213> Homo sapiens

<400> 99

Met Gln Arg Arg Gly Gln Pro Leu Glu Asn His Val Ala Leu Ile His
1 5 10 15

Trp Gln Ser Ala Gly Ile Pro Ala Ser Lys Val His Asn Tyr Cys Asn
20 25 30

Met Lys Lys Ser Arg Leu Gly Arg Ser Arg Ala Val Arg Ile Ser Gln
35 40 45

Pro Leu Leu Ser Pro Arg Arg Cys Pro Leu His Leu Thr Glu Arg Gly
50 55 60

Ala Gly Leu Leu Gln Pro Gln Pro Gln Gly Pro Val Arg Thr Pro Gly
65 70 75 80

Pro Pro Pro Gly Val Thr Gln Arg Pro Arg Thr Thr Glu
85 90

<210> 100
<211> 582
<212> PRT
<213> Homo sapiens

<400> 100

Asp Val Ser Arg Cys Ala His Arg Ala Arg Pro Gly Ala Ile Met Leu
1 5 10 15

Leu Leu Pro Ser Ala Ala Asp Gly Arg Gly Thr Ala Ile Thr His Ala
20 25 30

Leu Thr Ser Ala Ser Thr Leu Cys Gln Val Glu Pro Val Gly Arg Trp
35 40 45

Phe Glu Ala Phe Val Lys Arg Arg Asn Arg Asn Ala Ser Ala Ser Phe
50 55 60

Gln Glu Leu Glu Asp Lys Lys Glu Leu Ser Glu Glu Ser Glu Asp Glu
65 70 75 80

Glu Leu Gln Leu Glu Glu Phe Pro Met Leu Lys Thr Leu Asp Pro Lys
85 90 95

```
Asp Trp Lys Asn Gln Asp His Tyr Ala Val Leu Gly Leu Gly His Val
          100                 105                 110

Arg Tyr Lys Ala Thr Gln Arg Gln Ile Lys Ala Ala His Lys Ala Met
      115                 120                 125

Val Leu Lys His His Pro Asp Lys Arg Lys Ala Ala Gly Glu Pro Ile
  130                 135                 140

Lys Glu Gly Asp Asn Asp Tyr Phe Thr Cys Ile Thr Lys Ala Tyr Glu
145                 150                 155                 160

Met Leu Ser Asp Pro Val Lys Arg Arg Ala Phe Asn Ser Val Asp Pro
                165                 170                 175

Thr Phe Asp Asn Ser Val Pro Ser Lys Ser Glu Ala Lys Asp Asn Phe
          180                 185                 190

Phe Glu Val Phe Thr Pro Val Phe Glu Arg Asn Ser Arg Trp Ser Asn
      195                 200                 205

Lys Lys Asn Val Pro Lys Leu Gly Asp Met Asn Ser Ser Phe Glu Asp
  210                 215                 220

Val Asp Ile Phe Tyr Ser Phe Trp Tyr Asn Phe Asp Ser Trp Arg Glu
225                 230                 235                 240

Phe Ser Tyr Leu Asp Glu Glu Glu Lys Glu Lys Ala Glu Cys Arg Asp
                245                 250                 255

Glu Arg Arg Trp Ile Glu Lys Gln Asn Gly Ala Thr Arg Ala Gln Arg
          260                 265                 270

Lys Lys Glu Glu Met Asn Arg Ile Arg Thr Leu Val Asp Asn Ala Tyr
      275                 280                 285

Ser Cys Asp Pro Arg Ile Lys Lys Phe Lys Glu Glu Glu Lys Ala Lys
  290                 295                 300

Lys Glu Ala Glu Lys Lys Ala Lys Ala Glu Ala Lys Arg Lys Glu Gln
305                 310                 315                 320

Glu Ala Lys Glu Lys Gln Arg Gln Ala Glu Leu Glu Ala Ala Arg Leu
                325                 330                 335

Ala Lys Glu Lys Glu Glu Glu Glu Val Arg Gln Gln Ala Leu Leu Ala
          340                 345                 350

Lys Lys Glu Lys Asp Ile Gln Lys Lys Ala Ile Lys Lys Glu Arg Gln
      355                 360                 365

Lys Leu Arg Asn Ser Cys Lys Ile Glu Glu Ile Asn Glu Gln Ile Arg
  370                 375                 380

Lys Glu Lys Glu Glu Ala Glu Ala Arg Met Arg Gln Ala Ser Lys Asn
385                 390                 395                 400

Thr Glu Lys Ser Thr Gly Gly Gly Gly Asn Gly Ser Lys Asn Trp Ser
                405                 410                 415
```

Glu Asp Asp Leu Gln Leu Leu Ile Lys Ala Val Asn Leu Phe Pro Ala
420 425 430

Arg Thr Asn Ser Arg Trp Glu Val Ile Ala Asn Tyr Met Asn Ile His
435 440 445

Ser Ser Ser Gly Val Lys Arg Thr Ala Lys Asp Val Ile Gly Lys Ala
450 455 460

Lys Ser Leu Gln Lys Leu Asp Pro His Gln Lys Asp Asp Ile Asn Lys
465 470 475 480

Lys Ala Phe Asp Lys Phe Lys Lys Glu His Gly Val Val Pro Gln Ala
485 490 495

Asp Asn Ala Thr Pro Ser Glu Arg Phe Glu Gly Pro Tyr Thr Asp Phe
500 505 510

Thr Pro Trp Thr Thr Glu Glu Gln Lys Leu Leu Glu Gln Ala Leu Lys
515 520 525

Thr Tyr Pro Val Asn Thr Pro Glu Arg Trp Glu Lys Ile Ala Glu Ala
530 535 540

Val Pro Gly Arg Thr Lys Lys Asp Cys Met Lys Arg Tyr Lys Glu Leu
545 550 555 560

Val Glu Met Val Lys Ala Lys Lys Ala Ala Gln Glu Gln Val Leu Asn
565 570 575

Ala Ser Arg Ala Lys Lys
580